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DETROIT

'It's Important to Know In Time'

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The Newspaper of the Industry

Air Conditioning & REFRIGERATION NEWS

AN INTERNATIONAL INSTITUTION ★ SUBSCRIBERS ALL OVER THE WORLD ★

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'Written to be Read on Arrival'

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OPM Issues A-10 Rating Orders For Repairs; Coverage Is Hazy

Household Refrigerators Not Yet Covered By Preference Rating

WASHINGTON, D. C.—The long-awaited A-10 Priority Rating for repair parts for refrigerating equipment became a fact last week with the issuance by OPM of Preference Rating Order No. 22—but there remained considerable speculation as to just how inclusive this order is of all kinds of refrigerating equipment. It does not seem to cover household refrigerators.

As predicted by AIR CONDITIONING & REFRIGERATION NEWS a couple of months ago, the A-10 rating for repair parts comes as part of the Preference Rating Order for 20 essential industries. Number 8 in this list is specified as follows:

"Food processing or storing—plants engaged in any of the following: milling, refining, preserving, refrigerating, wholesaling, or storing of food for human consumption or livestock feed."

(Text of Preference Rating Order P-22 will be found on page 6 of this issue.)

(Concluded on Page 39, Column 1)

Independent Firm Sought To Operate N. Y. Service Plan

NEW YORK CITY—In a closed meeting Sept. 9 the Consolidated Edison Co.'s plan for establishing a company to handle appliance repairs on a centralized basis for all territory served by the Consolidated Edison system, was explained to a selected group of manufacturers, distributors, and service men.

Few additional details concerning the plan other than the lengthy outline published in the Sept. 10 issue of AIR CONDITIONING & REFRIGERATION NEWS leaked out from the meeting. It was indicated that another meeting will be held Sept. 20 in which an effort will be made to draw up plans for the incorporation of a company to operate the plan.

A semi-official statement from the utility explained that the proposed cooperative appliance service outfit is not to be a subsidiary of Consolidated Edison in any sense—financially, personnel, etc. It is proposed in the same manner as the appliance testing activity.

The utility will work with the plan in three principal ways:

(Concluded on Page 40, Column 3)

Committee Starts Plans To Simplify Household Boxes

WASHINGTON, D. C.—Work on emergency standards to be used as a basis for simplification of household refrigerators has been started by a committee of American Standards Association meeting with the Consumer Division of the Office of Price Administration.

Attending the meeting as representatives of refrigerator manufacturers were: J. H. Ashbaugh, Westinghouse; J. C. Buchanon, Norge; L. A. Philipp, Nash-Kelvinator; W. M. Timmerman, General Electric; William R. Hainsworth, Servel; and W. Paul Jones, Philco. Among those representing the consumer and government were: Dickson Reck, Consumer Division, Office of Price Administration; Samuel P. Kaidanovsky, Standards Section, Consumer's Counsel Division, Department of Agriculture; Lenore Sater, Bureau of Home Economics; A. C. Bredahl, U. S. Housing Authority; and E. F. Mueller, Bureau of Standards.

Purpose of the group is to work out methods to conserve strategic materials needed in defense, and to reduce overhead and labor costs by eliminating unnecessary accessories and by cutting down on the number of models produced.

Suggestions presented at the initial meeting, which was conducted by Mr. Timmerman, will be developed

(Concluded on Page 40, Column 3)

Refrigeration Town Meeting Asks Naming of Committee To Carry Fight For Dealers' Existence

Need For Support of All Industry Factors Is Emphasized To Save Retail and Service Business

DETROIT—Determined to do their part in explaining refrigeration's essentiality to America, 121 men connected with the distribution of refrigeration equipment came from all parts of the country to the offices of AIR CONDITIONING & REFRIGERATION NEWS Sept. 10, and staged a free-for-all discussion on ways and means of making their voices heard.

After a long afternoon of suggestions and counter-suggestions, of recitals of the priorities-and-supplies problems of parts jobbers, of household refrigerator distributors and dealers, and of commercial refrigeration and air conditioning sales firms, it was agreed that a committee should be formed embracing all non-manufacturing branches of the industry.

Purpose of this committee will be to recruit more members of the industry's distribution system in a big, cooperative effort to "sell" their importance and that of the industry to the powers-that-be in Washington.

Speaker after speaker noted that all previous OPM, OPACS, and OPA conferences and Washington have ignored distribution. And distributing firms—distributors, dealers, jobbers, service men—comprise the vast bulk of the industry.

So it was decided that this end of the business should speak up in defense of the whole industry, that it should tell honestly what refrigeration does for America. The men who put refrigeration products into the public's hands, it was agreed, know best just how useful refrigeration is.

How will they present this information? That's up to the committee to decide. But numerous ways were suggested at the mass meeting—letters to Congressmen, petitions, presentations to SPAB, radio and press publicity, and even a "sitdown strike" to give the country a taste of what daily life would be without refrigeration maintenance!

A transcript of the session—abbreviated because of shortage of space, but indicative of the tone and tenor of the meeting—follows:

H. G. BOGART, H. G. Bogart Co., Toledo—I will talk of what I have done, relative to the proposed exise tax on electric ranges. I had a good response on my efforts. I had my dealers write their senators. Result: The proposed tax will apply to all cooking equipment, instead of just electric alone.

The second attempt: I asked all of our dealers to report what proportion of their total business was in appliances — particularly refrigerators; how many people were dependent on it; and their best estimate of how much they paid in wages and the number of people dependent on those wages. The response wasn't so good.

My suggestions: Go to dealers and bring pressure. It is important to

(Continued on Page 4, Column 1)

Next Week: The Committee

After careful selection, a committee of workers from wholesale and retail firms in the refrigeration industry, to be known as the Temporary Educational Committee of Refrigeration Distributors, will be announced in next week's issue of Air Conditioning & Refrigeration News. Volunteers are welcome.

Expressing a Willingness To Fight For Their Business

(Left) "There'll be a lot of business houses and plants that can't open their doors if their air conditioning systems aren't operated," warns Harry LeVine, air conditioning dealer.

(Center) "We're willing to have a delegation go directly to Washington," says Fred B. Hovey, Jr., representing the National Refrigeration Supply Jobbers Association.

(Right) Frank Langsenkamp of the F. H. Langsenkamp Co., Indianapolis, proposes an all-industry publicity campaign to spread the story of how essential refrigeration is to the nation.

(Left) G. R. Whippo of the Weatherhead Co., Cleveland, plugs for a committee to take some direct action.

(Center) "We've made some moves already, and have learned that the distributor and dealer must fight for themselves. We in Wisconsin will back your plans," says H. L. Ashworth, secretary, Wisconsin Radio, Refrigeration & Appliance Association.

(Right) "I've put pressure on my Congressmen and got results," relates E. S. Wright, Youngstown dealer and service firm operator. Men from many states attended.

Distributors Offered These Plans of Action

Set a special date for concerted action, and have every member of the industry—manufacturer, distributor, jobber, dealer, service man, salesman, and factory worker—write or wire his congressman or the President on that day, impressing upon them that "refrigeration is essential to America's health and efficiency."

Have the users of refrigeration equipment in your territory write to their congressmen, stressing the importance of this equipment in their daily lives.

Have such users of refrigeration equipment as butchers, grocers, etc. induce *their* customers to impress upon this country's leaders the importance to them of properly refrigerated foods. This could be accomplished through gaining cooperation of the national associations of meat packers, grocers, etc.

Institute a nation-wide movement among household refrigerator dealers, to get across the story of how importantly such dealers figure in the life of their individual communities.

Appoint an industry-wide "public relations and publicity committee" to tell the whole industry's story, contact the national organizations of users affected by refrigerator curtailment, and enlist their aid in reaching the ultimate consumer. An industry-wide radio program also was suggested.

Put dealers and service men to work by having them impress upon their customers what it means NOT to have proper refrigeration. Enlist users' aid by a concerted program of local newspaper advertising, sponsored cooperatively in the various communities.

Organize one "master association" of all branches of the refrigeration industry to tell the industry's story. Another suggestion along this line was that a "Refrigeration Equipment Chamber of Commerce" be formed, to represent all branches of the industry in its efforts to "sell" the necessity of its services to the nation.

Adopt some slogan, such as "Refrigeration IS Defense," to be used throughout the industry.

(Concluded on Page 40, Column 2)

Wallace and Nelson Admit They Have No Decision On What Is 'Non-Essential'

Thus Way Is Open Yet To Prove Essentiality

WASHINGTON, D. C. — Shortly after the formation of the new Supply Priorities & Allocations Board (SPAB), the daily press carried a sensational story from the office of Vice President Henry Wallace which seemed to say, in effect, that all productive effort in the country must be bent to defense activity, and that certain "non-essential" industries were scheduled for elimination, at least temporarily.

Subsequent follow-ups on the story revealed that Vice President Wallace hadn't meant anything quite so drastic as that. Last week AIR CONDITIONING & REFRIGERATION NEWS received from OPM the "official version" of the press conference on the subject of "civilian sacrifice."

This is being reprinted in full for the reason that the interview shows clearly that there was at the time (and quite apparently not yet) no decision on just what industries are considered "non-essential," nor any clear program for allotting materials to civilian industry.

The story indicates that there is still time to prove that an industry is essential.

Following is the official text of the press conference:

Q. Mr. Vice President, the very first paragraph, it seems to me, there was a sweeping statement made that all men must be employed on defense or essential uses.

Mr. Wallace. Every man and machine which can be used effectively must be employed either on direct defense requirements or at work essential to the civilian economy. Well, newspapers are essential if that is what you want.

Q. There are many other industries at the moment booming. Does that mean they will be immediately shut down or converted?

Mr. Wallace. Well, I don't know what you have in mind, I am sure.

WHAT IS ESSENTIAL?

Q. Well, we got a favorite around this building, Mr. Vice President. We always talk about automobiles when we talk about industries which are booming and not producing for defense. Of course the OPM—

Mr. Wallace. Let us take it this way: That, generally speaking, unless something else comes into the picture, in the case of goods in a semi-luxury class we would look askance on increased per capita consumption above that which took place, shall we say, in 1937, 1938, 1939.

Q. It is this Board's job, is it not, sir, to take over the functions which have previously been performed jointly and separately by OPM and OPACS on such questions as, let us say—

Mr. Wallace. Not its functions; not its administrative functions; the policy functions; the policy decisions.

Q. Decisions as to production rates of non-defense industries where the goal is to conserve materials for defense?

Mr. Wallace. Yes, because no one of those agencies really has the power to do it by itself.

THE POWER OF PRIORITY

Q. (Referring to the board's statement) Mr. Vice President, you speak of materials which may be hoarded into the cellars and attics of industries and it will be routed out for use where most needed—that means for the first time, then, the OPM is going to go out and grab these inventories?

Mr. Wallace. You will notice the next sentence indicates—it doesn't necessarily mean we go out and grab because the next sentence indicates. You see, we got the power of priority. We just take it into account when that industry comes up for next priority.

Q. Maybe you won't want that industry to have priorities.

Mr. Wallace. That is exactly the point.

'FIRST THINGS FIRST'

Q. I was thinking about supplies that might be too much even to wait for the next priority.

Mr. Wallace. Well, there might be some extreme cases of that sort. I would say that is rather doubtful.

Mr. Nelson. I don't know of any of those at the present time. I haven't seen any of them. There may be. If they do why we will have to find ways of meeting them.

Mr. Wallace. Of course, if you get desperately short in some particular raw material, you might.

Mr. Nelson. Definitely you are. Our motto is first things first.

Q. Do you intend to make up a list of less essential industries? Or indicate what they are?

Mr. Wallace. I don't think we will issue any such list, no.

Q. Could you give what might be considered as essential?

NO 'BLANK-OUT' LIST SEEN IN OPM

Q. Mr. Vice President, while we are on that subject, the "New York Times" carried a story this morning quoting this fellow Churney saying that the OPM had listed 40 industries which were to be blanked out as non-essential. Do you know anything about that?

Mr. Nelson. Never heard anything about it.

Q. Well, this was a front page story. It was a front page story in the "New York Times" this morning. He addressed some institute or gave a report. He didn't list the concerns but he said there were forty industries which OPM had secretly listed as due to be blanked out.

Mr. Nelson. I have never seen any such list. Now the Office of Civilian Supply, as you know, has rated certain industries. Taking the case of plastics, they have listed three different groupings in which plastics shall be used as available. Now, of course, those will guide.

Q. They didn't say OPACS. It said OPM.

Mr. Nelson. I have never seen any in OPM.

Q. Could you give us some indication as to what this conservation program will include? Will it be a reduction in the number of designs, models, and shapes of materials or will it—

Mr. Wallace. It will be that kind of thing.

Q. Would it include the pick-up campaign—scrap materials?

Mr. Wallace. It is possible.

Mr. Nelson. It will.

Q. Standardization of models?

CONSERVATION AS A REQUISITE TO PRIORITY

Mr. Nelson. Not standardization of models—simplification of models and plus—I think it is a very important point. For instance, in the granting of a priority, we want to be certain that that is absolutely essential. It may be necessary to reduce the number of models or to reduce the amount of certain essential materials in that particular thing before granting a priority.

Q. You mention here a realistic all-out defense program. The inference there is we have been thinking in terms of an unrealistic program?

Mr. Wallace. Well, the world situation has been such that we have been forced to become realistic right along. We still haven't reached that.

Q. Is the general public aware in any degree of how much it is going to have to sacrifice? Can you give any idea? You mention there about informing the public.

Mr. Wallace. I think we may have a little press conference, you know, in which that might be gone into in some detail. As a matter of fact, I suggest to Mr. Nelson that very subject would be well worth going into in great detail some time during the next three weeks.

Q. At your convenience we would be very glad to get into that.

Mr. Wallace. It is very complex.

Q. Your statement of over-all that you can't expect to have greater consumption than we had in peacetime and still do a good job in defense implies that our problem is not in curbing business as usual but that business is better than usual?

Mr. Wallace. Don't you think that is an applicable statement?

Mr. Nelson. No, sir, because I don't think you can have business as it used to be in many of these things. We don't have enough of it.

Q. I was suggesting that a lot of business is going better than usual.

Mr. Wallace. It is—it may be. Some of them have gone a lot better than usual.

Q. That is what I was asking.

Mr. Wallace. You have greater payrolls, you have greater profits, you have greater farm income. Even taking into account the increase in cost of living, it has greater purchasing power. The average payroll, the average income of the farmer, the profit of the businessman has greater purchasing power on the average, and there might be exceptions to that.

SOME BUSINESSES MUST CLOSE

Q. On account of priorities are there any businesses that will have to close up?

Mr. Wallace. Do you know of any, Mr. Nelson?

Mr. Nelson. There may be, easily. If materials aren't enough to go around. We are just going to have to face it on the less essential industries as I see the picture, and there will be some. There are bound to be some. There isn't enough materials to take care of a realistic all-out defense program we are undertaking and keep every industry alive. It isn't possible—not that we want to put them out of business. There just isn't enough. It will have to be distributed where it is going to do the country the most good.

Q. Tell us what those industries are.

Mr. Nelson. If you will let us get that up adequately. Now, mind you, the Board has been in operation only three days and two of those were holidays. We will have some real information on that subject.

Locker Men To Hear Defense Duties

OMAHA, Neb. — Planned panel discussions, rather than prepared speeches, will be the chief medium for the exchange of information at the third annual convention of the National Frozen Food Locker Association scheduled to be held Sept. 23-25 at Hotel Fontenelle here.

These discussions will be presided over by industry leaders, but all locker operators sitting in on the sessions will be asked to take part by voicing opinions and offering their experiences on the topic of discussion.

To lighten up the convention sessions, a series of four dramatic skits will be presented by exhibitors. Three of these will be "all in fun," while the fourth will offer some sound ideas on locker plant management. Details of this "Exhibitors' Gridiron," as it is called, are being deliberately withheld.

The role which government officials in Washington expect the locker industry to assume in relation to the nation's defense effort will be outlined by R. B. Snowden, Jr., vice president of Frozen Foods Locker Co., Memphis, Tenn., and first vice president of the national association.

Discussion on "Keeping Tab On Costs" will be led by Alfred Cory of Ft. Atkinson, Wis., secretary-treasurer of the Wisconsin locker association, who has made a detailed study of this subject. He will be assisted by S. T. Warrington, economist for the Farm Credit Administration, Washington, D. C.

"What Women Expect In Locker Service" will be the topic of a discussion led by E. Jean Reis, assistant editor of "The Locker Operator"; Gertrude Allen, extension nutritionist at Kansas State College; Ruth Cessna, extension nutritionist at Iowa State College; and Clara Anderson, home demonstration agent in Colorado.

MANPOWER AND MATERIALS

KEYS TO NATIONAL DEFENSE

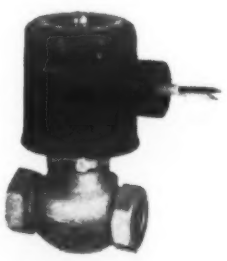
-they must be conserved

Defense requirements must come first. Demands are heavy—will be heavier—and they must be met. Hence, it is a patriotic duty to conserve manpower and materials —the twin keys to National Defense.

In laying out refrigeration and air conditioning installations, it is necessary to consider these factors. As the army grows—capable service men will be fewer—the answer is equipment that requires minimum service. If equipment is ineffective and has to be replaced, added and unnecessary loads are thrown on production machines needed for turning out military supplies. Additional materials must be used which may be needed elsewhere. Select equipment that won't have to be replaced.

Detroit Refrigeration Valves and Controls have proved their dependability, effectiveness and durability. They make the least possible demands in service and replacements.

No. 673
Thermostatic
Expansion Valve



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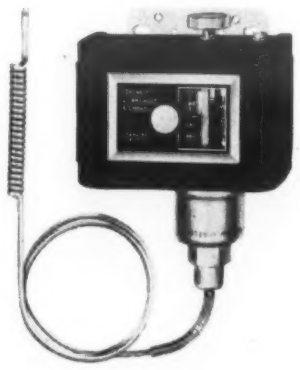
Solenoid Valve



No. 450 ZL-1
Temperature Control

DETROIT LUBRICATOR COMPANY

General Offices: DETROIT, MICHIGAN

Canadian Representatives—RAILWAY AND ENGINEERING SPECIALTIES LIMITED, Montreal, Toronto, Winnipeg

SO THAT'S WHERE THOSE BIG PROFITS COME FROM!

That's where hundreds of dealers are drawing big dividends— A-S-E Froz-n-Food UNIT Lockers. Easy to sell, this highly profitable line has plenty of customer-convincing features. They're easy to install and there is no unprofitable servicing. Repeat orders are steady.

A-S-E Froz-n-Food UNIT Lockers meet every refrigerated locker requirement exactly. Ask us how to add this highly profitable line. Write today.

SOLD ONLY THROUGH DEALERS

ALL-STEEL-EQUIP COMPANY
Incorporated
109 KENSINGTON AVE. AURORA, ILL.

Makes It Safe To Be Hungry

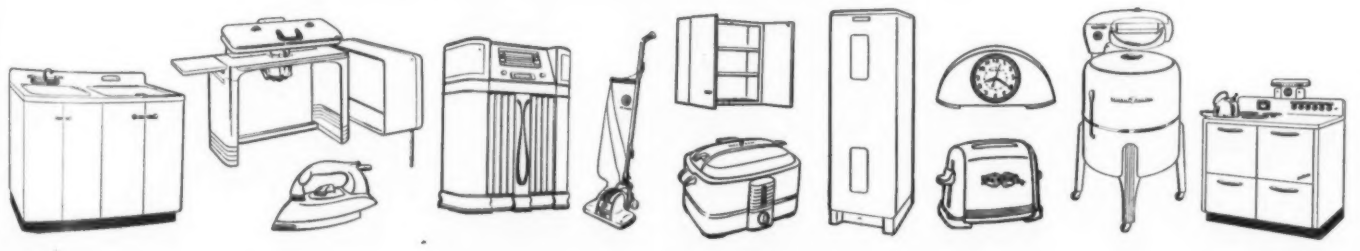
*2,265,588 NEW REASONS EVERY YEAR WHY THERE'LL ALWAYS BE ELECTRIC REFRIGERATORS

Consider the millions of babies who are born each year. Is there *anything* more important than protecting their health to make them strong, sturdy citizens of tomorrow? The food they eat is supremely important. It must be adequate, it must be nourishing, it must be *safe to eat.*

Today modern electric household refrigerators are keeping foods free from contamination in millions of homes. Let's not fall down on THAT job. Let's *keep on* making it safe to be hungry!

**Annual birth rate according to latest U. S. census.*

Because of the national emergency, General Electric Dealers are temporarily hard-pressed to supply the unprecedented demand for G-E Refrigerators. But—*and most fortunately*—General Electric Dealers can draw on a COMPLETE line of G-E household products to hold their present customers and to create new ones.



General Electric has pioneered and given to the industry more basic engineering accomplishments than any other refrigerator manufacturer. Foremost among these are the famed Hermetically Sealed-In-Steel Mechanism and the All-Steel Cabinet.

★ ★ ★

Defense comes first. For example, the navy's great new battleship NORTH CAROLINA was commissioned *five months* ahead of schedule, and the General Electric propulsion equipment in it was completed, ready for installation, *ahead of scheduled time.*

Because of the defense situation and resulting priorities, changes in some materials may be necessary.

But regardless of these limitations, there will never be any compromise with General Electric quality and lasting value.

GENERAL ELECTRIC

Meeting Rallies Distributors, Dealers, and Servicemen To Fight Own Battle

'The Trade Must Be Aroused' Is Keynote of Detroit Town Meeting

(Continued from Page 1, Column 5)

get the whole industry into it. The manufacturer is not enough. We must get the dealers into it, because nothing else makes so big an impression. I am willing to underwrite a program to arouse the interest of the dealers.

E. S. WRIGHT, Bonded Refrigeration Service, Youngstown, Ohio—Manufacturers and jobbers are doing a good job of fighting for the service man, but service organizations should help get some sort of priority. I have been personally successful in getting priorities through Congressmen. The reason I have received consideration is that the people simply **had** to have it.

I have to do a lot of service work and have been able to get a lot of letters from a lot of customers saying that they are vital to the industry. Service organizations must be set up to take care of the warehouses. They must be responsible for the merchandise in warehouses. The fellows are not going to fight for themselves. We must go to the roots of the matter. We must have food, therefore we must have refrigeration. We have to get an expression from the people themselves. **Get customers to write their Congressmen.** Service men should tell their customers they can't get material for repair, then get the customers to write to their Congressmen. The service man is the fellow who contacts the ultimate user. In other words, the service man is the one who should work on the consumer.

JACK MILLER, St. Louis—We should set a date, say three weeks from now, and announce it on every bulletin board of every business, factory, etc. related in any way to the industry. And on this day send a flood of form letters, telegrams, etc. from every company in the refrigeration industry, including all classes of employes from top to bottom, to their Congressmen. The sign on the bulletin boards would explain the importance of this letter to their own welfare.

JACK FORBES, Pittsburgh—The only one who is going to be able to help us is the actual user of mechanical refrigeration. The important fact is "How essential is the industry?" We must establish the fact that we are essential. The only way we can do this is through the users of mechanical refrigeration.

IRVING ALTER, Harry Alter Co., Chicago—Butchers, bakers, grocers, etc. should promote refrigeration for us. Refrigeration is just as essential to them as to us. We cannot supply new units, therefore it makes it worse for them, because they cannot go back to ice. The frozen food industry, packing industry, meat industry, baker, grocer, etc. organizations can be contacted through us.

H. C. LE VINE, Detroit—We cannot exist without refrigeration. Many buildings are built for air conditioning and would have to close their doors if there were no "Freon" available. Someone has got to get everyone together. They wouldn't sit by so quietly if they knew what the predicament of our industry would mean to them.

H. W. SMALL, Minneapolis—My proposal would be to appoint a committee on public relations and publicity, the duties of which would be to create a public demand for priorities and the maintenance of existing commercial refrigeration equipment. The committee should get in touch with the national organizations in the fields mentioned, and from that point we could reach the ultimate consumer. Pressure from them should be sufficient to get the priority.

TED GLOU, Central Service Supply Co., Syracuse, N. Y.—The anti's are always more powerful than the pros. The more pressure you use in politics, the easier it is to get what you want. What we want is the individuality of each of our own organizations. (I am a jobber.)

Six different organizations have asked me to join. Each one of those organizations could be a small part of a whole. They should be gathered together into one group which would be a master association, taking in all of the little organizations. It could act as a center of pressure under the direction of one large organization rather than a lot of little ones.

J. M. OBERC, J. M. Oberc Co., Detroit—I suggest that an association be formed for advertising and publicity purposes and supported by us and I will help to underwrite it. George could show the public the importance of our problem and edit the material. We must get all people behind us. We must all contribute to this association instead of paying dues, and our purpose would be to contact all service men, all jobbers, all butchers, all distributors. It is important that this organization be headed by a competent man—really competent. By the way, how many of you followed George's advice in his editorial to write to Washington? If Gerald L. K. Smith can stir up 1,000,000 men on the radio, what couldn't we do? The whole United States is thinking about refrigeration. Refrigeration is being talked about. Newspapers can do a lot. For example: George Taubeneck has invited us as his guests to draw us together. George and his paper and his efforts certainly have done something. If the proper committee gets to the proper people, we would get good action.

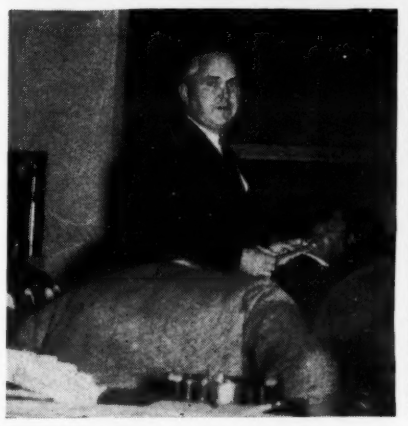
HOWARD HUBBELL, Brass & Copper Sales, St. Louis—I am terribly optimistic. I have just come back from Washington and I don't agree with all these people who are saying that Washington does not see the importance of refrigeration. We are going to get what we want. OPACS is interested. I attended a Chicago meeting, and from there we went down to Washington.

OPACS wants refrigeration to get to the people who want it and need it. They are sold on refrigeration jobbers and metal men. They (OPACS) are with us. My experience is that our appeals were accepted very well. OPM are definitely business men. They aren't radical. They are a high-grade bunch of men. They are cooperative. We mustn't wave a red flag. To go in fighting is the wrong attitude.

H. W. SMALL, Thermal Co.—How do non-defense customers obtain materials?

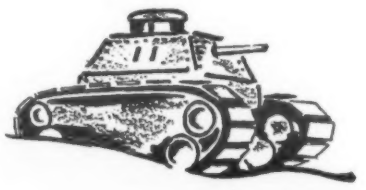
HUBBELL—They don't. But re-

(Continued on Page 9, Column 1)



The Refrigeration Town Meeting in action! (Upper left) "We'll back the dealers in their fight for existence," says E. T. Murphy, vice president of Carrier Corp., and president, Air Conditioning & Refrigerating Machinery Association. (Upper right) A. B. Schellenberg, president of Alco Valve Co., says the situation is like a crew race—it's best when there is support along the entire course of the race, and he encourages dealers, distributors, jobbers, and service men to make themselves heard. (Lower left) John A. White of the John A. White Distributing Co., one of the oldest distributors of household electric refrigerators in the country, urges a "united front" by distributors and dealers. (Lower right) W. C. Allen, vice president, Modern Equipment Corp., describes the set-up and purposes of the committee which OPM named for the industry, and of which he is a member. It takes care of the manufacturer's problems, but not those engaged in distribution.

THESE are troublous times. Now, as never before, we need every bit of stamina we possess . . . and perhaps a bit more. With the defense demands of battleships, submarines, cantonments, aircraft plants, and many more levying tremendous requirements on our production facilities, it would be easy to permit patriotism to cover up inherent weaknesses in engineering and management. It would be easy to forget the little fellow who needs a replacement part when defense contracts MUST be filled on schedule. It would be easy, too easy, to let productive capacity follow instead of pace production requirements.

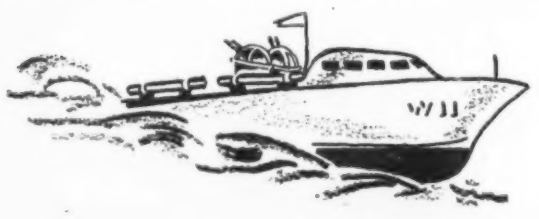


Bush products have pioneered the commercial cooling industry. It is no accident that many of the most notable developments in refrigeration have come out of the Bush Laboratory and been introduced by the Bush Organization.

Sound engineering and sound management . . . fully capable of expanding capacity IN ADVANCE of requirements . . . have proved equal to the task of meeting BOTH defense and normal demands.

Every order, from whatever source, is regarded as a definite obligation . . . a challenge which has and will continue to be met to the full limit of our abilities.

In short, these are days which require stout hearts and level heads . . . a capacity for work and MORE work. Whether tomorrow brings bombs or boogie-woogie, what we need right now is backbone . . . the vertebrae of victory.

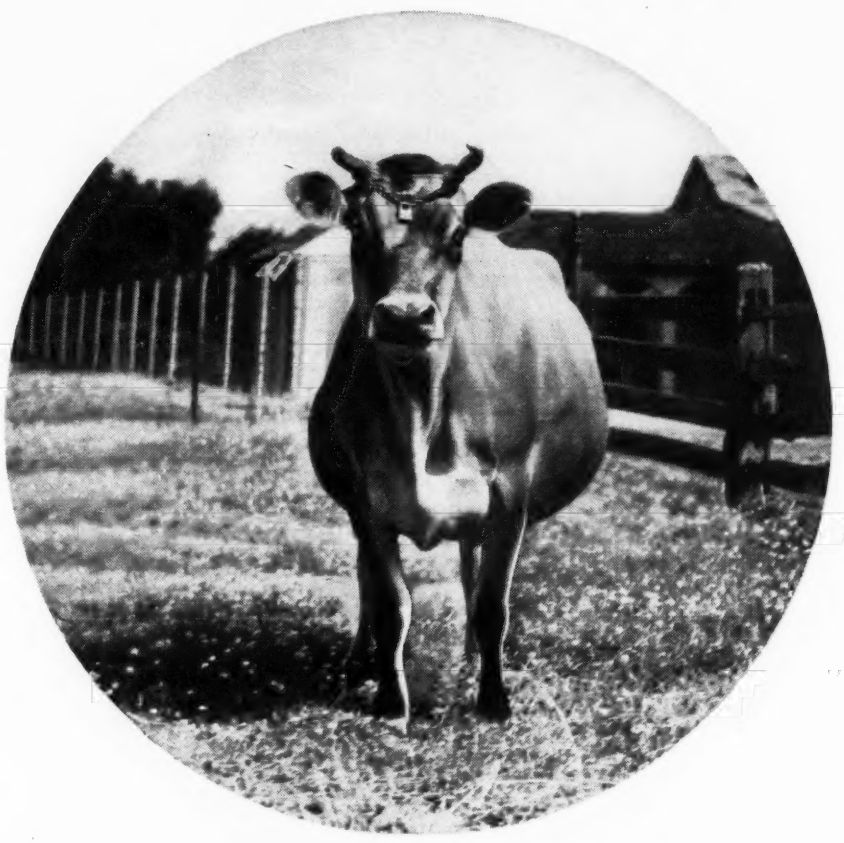


BUSH MANUFACTURING CO.

★ *Commercial Cooling Units* ★

HARTFORD, CONNECTICUT ★ 610 N. OAKLEY BLVD., CHICAGO, ILLINOIS

In the first row in this picture we find Tom Farrell, Kelvinator commercial sales manager; J. A. White, Grand Rapids distributor; and Charles Lawson, Kelvinator sales manager (present as an observer) doing some listening as Claude Brunton, Huntington, W. Va., dealer and service firm operator, outlines his difficulties in obtaining supplies.



Do you keep a COW in your back yard?

It isn't likely.

But unless you do, you are among the millions who must depend on refrigeration to keep milk fresh until it gets to your home—and to keep it safe while it is in your home.

To protect milk and all other foods from spoilage—that is the contribution of mechanical refrigeration.

Doing this it has revolutionized the diet of America.

It protects fresh foods brought to us from the far corners of the land.

It saves untold millions of dollars which annually would be lost—because it guards against food waste.

It protects health, the value of which cannot be estimated.

It reduces the cost of living by preventing food waste and by reducing refrigeration costs.

It Is Time To Re-Tell This Story!

As refrigeration men we know all of these consumer benefits. But how often do we tell them to customers?

While selling the pleasure and convenience of owning a refrigerator have we neglected to mention that its primary purpose is to preserve food?

Governmental efforts today are aimed at retarding rising costs of living and preventing food wastes. Therefore it is doubly important at this time that we emphasize this primary function of refrigeration.

Frigidaire's Responsibilities

Because of our position in the industry, established by the sale of nearly seven million Frigidaires, we have an important interest in the great public service of mechanical refrigeration.

This interest is shared by every member of the Frigidaire organization.

In the factory it is the responsibility of thousands of workers to produce better refrigeration year after year.

In the field it is the responsibility of thousands of Frigidaire dealers and salesmen to bring the benefits of this better refrigeration to families in every income class, in cities and rural communities alike.

The present emergency has given us added responsibilities.

We are installing thousands of Frigidaire products in army camps—on naval ships—and in defense housing projects—because the Government recognizes the importance of adequate refrigeration.

We are producing machine guns ahead of schedule in a brand-new plant.

We are now constructing another large plant to produce parts for airplane propellers.

Other defense items requiring equal precision are being manufactured daily.

To protect the nation's food and health—

To help keep living costs down—

To do its full part to provide weapons for the defense of America—

Frigidaire meets and welcomes these responsibilities.

Frigidaire

FRIGIDAIRE DIVISION • GENERAL MOTORS SALES CORPORATION • DAYTON, OHIO

REFRIGERATION EQUIPMENT FOR EVERY INDUSTRIAL, COMMERCIAL AND HOME NEED

Text of OPM's Preference Rating Order on Materials For Repairs

Preference Rating Order No. P-22

958.1 PREFERENCE RATING ORDER. For the purpose of facilitating the acquisition of Material for the Repair of the property or equipment of certain industries and services hereinafter specified, a preference rating is hereby assigned to deliveries of Material for such purpose upon the following terms:

(a) *Definitions.*

(1) "Producer" means any individual, partnership, association, corporation, governmental unit, or other organization engaged in one or more of the following industries and services, and such other industries and services as may be added from time to time by supplement to this Order:

(i) The following Federal, State, County, and municipal services: Fire and police services; Highway maintenance.

(ii) Carriers:

(a) Urban, suburban, interurban, and intercity common, contract, and private carriers of passengers or freight by electric railway, electric coach, motor truck, or bus, including terminals.

(b) Railroads, including terminals.

(c) Shipping—Commercial carriers of freight and passengers by ocean, lake, river, or canal, including terminals.

(iii) Chemicals—Plants engaged in producing chemicals by chemical processing of raw materials.

(iv) Coke converting.

(v) Educational institutions (including vocational training).

(vi) Explosives—plants engaged in manufacturing explosives.

(vii) Farm machinery and equipment—plants engaged in manufacturing farm machinery and equipment.

(viii) Food processing or storing—plants engaged in any of the following: Milling, refining, preserving, refrigerating, wholesaling or storing of food for human consumption or livestock feed.

(ix) Highway maintenance and equipment—plants engaged in the production of equipment used in highway maintenance.

(x) Hospitals, clinics, and sanatoriums.

(xi) Lumber—plants engaged in the production of lumber (including planing, drying, storing, and treating of lumber), cooperage, plywood, and millwork.

(xii) Metallurgy—plants engaged in the production of metals and alloys.

(xiii) Mines and quarries (including ore dressing or processing plants and smelting facilities).

(xiv) Newspapers—plants engaged in the publication of newspapers.

(xv) Petroleum production, refining and transportation—plants and equipment used in petroleum production, refining and transportation.

(xvi) Radio—Commercial broadcasting and communication (not including home receiving sets).

(xvii) Research laboratories—industrial and academic.

(xviii) Rubber and rubber products—plants engaged in the production of rubber and rubber products including reclaimed and synthetic rubber.

(xix) Shipyards and Ship Repair Yards engaged in building and repairing ships (excluding yards devoted principally to pleasure craft).

(xx) Telephone and telegraph communication.

(2) "Material" means any commodity, equipment, accessories, parts, assemblies, or products of any kind.

(3) "Repairs" means only repairs needed because of an actual or imminent breakdown, from whatever cause, of a Producer's property or equipment.

(4) "Emergency Inventory" means minimum inventory of Material required to provide for Repairs to meet an actual or imminent breakdown, from whatever cause, of a Producer's property or equipment.

(5) "Supplier" means any person with whom a purchase order or contract has been placed by a Producer or any Supplier for

(i) Material to be used for Repairs;

(ii) Material required for a Producers' Emergency Inventory;

(iii) Material to be physically incorporated in other Material which is to be used for Repairs or which is required for a Producer's Emergency Inventory.

(b) *Assignment of Preference Rating.* Subject to the terms of this Order, Preference Rating A-10 is hereby assigned

(1) to deliveries to a Producer of Material required by him for Repairs or for his Emergency Inventory;

(2) to deliveries to a Supplier of Material which is, in turn, to be delivered to a Producer for Repairs or for his Emergency Inventory or to be physically incorporated in Material to be so delivered.

(c) *Persons Entitled to Apply Preference Rating.* The preference rating hereby assigned may be applied by

(1) a Producer;

(2) a Supplier, provided that he requires the Material so purchased in order to make deliveries duly rated pursuant to paragraph (b).

(d) *Application of Preference Rating.*

(1) A Producer in order to apply the preference rating to a delivery of material to him must endorse the following statement on the original and all copies of the purchase order or contract for such Material signed by a responsible official duly designated for such purpose by such Producer.

"Purchase Order for Repair or Emergency Inventory — Preference Rating A-10 under Preference Rating Order P-22."

Such endorsement shall constitute a certification to the Office of Production Management that such Material is required for the purposes stated therein. Any such purchase order or contract shall be restricted to material the delivery of which is rated in accordance herewith.

(2) A Supplier in order to apply the preference rating to a delivery of Material to him must endorse the following statement on the original and all copies of the purchase order or contract for such Material signed by a responsible official duly designated for such purpose by such Supplier:

"Purchase Order for Material required to fill a duly rated order for Repair or Emergency Inventory. This purchase order bears Preference Rating A-10 under Preference Rating Order P-22."

Such endorsement shall constitute a certification to the Office of Production Management that such Material is required to fill an order placed by a Producer or Supplier duly rated in accordance herewith. Any such Supplier's purchase order or contract shall be restricted to Material the delivery of which is rated in accordance herewith.

(3) A Producer or Supplier placing any such rated purchase orders or contracts and the Supplier selling the Material covered thereby, must each retain endorsed copies of such purchase orders or contracts segregated from all other purchase orders or contracts for a period of two years from the date thereof for inspection by authorized representatives of the Office of Production Management.

(e) *Restrictions on Application of Rating.* The Preference Rating hereby assigned shall not be applied

(1) by a Producer to obtain Material in excess of his requirements for Repairs or for his Emergency Inventory;

(2) unless the Material to be delivered cannot be obtained when required without such rating;

(3) by a Supplier to obtain Material in excess of the amount necessary to make rated deliveries.

(f) *False Statements and Penalties.* Any person who applies the preference rating hereby assigned in wilful violation of the terms and provisions of this Order, or wilfully falsifies records required to be kept or information to be furnished pursuant to this Order, or who obtains a delivery of Material by means of a material and wilful misstatement will be prohibited from further applying said rating. Such person may also be prohibited from obtaining further deliveries of Material under allocation and be deprived of any other priorities assistance. The Director of Priorities may also take any other action deemed appropriate, including the making of a recommendation for prosecution under Section 35A of the Criminal Code (18 U.S.C. 80).

(g) *Revocation or Modification.* This Order may be revoked or amended by the Director of Priorities at any time in whole or in part or in its application to any Producer or any Supplier. In the event of revocation, or upon expiration of this Order, deliveries already rated pursuant to this Order shall be completed in accordance with said rating, unless the rating has been specifically revoked. No additional applications of this rating to any other deliveries shall thereafter be made by any Producer or Supplier affected by said revocation or expiration.

(h) *Effective Date.* This Order shall take effect on the 9th day of September, 1941, and unless sooner revoked shall expire on the 28th day of February, 1942.

(P.D. Reg. 1, Aug. 27, 1941, 6 F.R. 4489; O.P.M. Reg. 3, March 8, 1941, 6 F.R. 1596; E. O. 8629, Jan. 7, 1941, 6 F.R. 191; E. O. 8875, Aug. 28, 1941, 6 F.R. 4483; sec. 2(a), Public No. 671, 76th Congress, Third Session, as amended by Public No. 89, 77th Congress, First Session; Sec. 9, Public No. 783, 76th Congress, Third Session.)

Donald M. Nelson, Director of Priorities

G-E Makes Howitzers On Standard Machinery

ERIE, Pa.—The latest 75-millimeter pack howitzers for the U. S. Army are being produced at the General Electric plant here, largely on machines previously used for making electric motors for street cars and locomotives.

Originally designed for mule transport, howitzers of this type are now towed on pneumatic tires by motorized troops. Some batteries have been carried by airplane in maneuvers.

The fact that the howitzer is only 47 inches long permitted boring operations to be performed on turret lathes already in the plant and, with some changes, other tools on hand were adapted for the work.

THE INDUSTRY DESERVES PRIORITY

In less than 20 years you have taken a costly dream . . . mechanical cooling . . . and built from it a gigantic industry devoted to the betterment of mankind and dedicated to meeting the limitations of the little fellow's pocketbook.

Because of your efforts, the farmer has fresh locker-kept meat the year 'round; quick-frozen seasonable foods for the entire nation regardless of seasons; milk for our children, safeguarded from spoilage . . . even blood storage for the wounded and advanced treatment and pain alleviation for cancer victims is now possible. These and many other modern wonders you have made not only possible, but practical and within everyone's reach.

Air conditioning, the right-hand partner of refrigeration, has supplemented these wonders with filtered, washed, humidified and cooled air for hospitals, factories, homes, churches, theatres, public buildings . . . and *now* air conditioning for blast furnaces, melting furnaces and Bessemer converters, so that *uniform* air supply will give uniform steel production for Defense. Yours is an industry vital to the United States in this emergency—not a luxury industry.

What priority regulation, then, does our industry deserve? Certainly not the strict limitations of a luxury industry, but just as certainly we deserve those regulations which will best serve the military preparedness in which we profess an important part through maintenance and protection of American health, efficiency and morale in hundreds of contributory ways.

It behooves us all to help develop and accept those regulations best serving our National Defense Program when considered in the light of our industry's importance to this effort, and to guarantee a high standard of quality in our product . . . uncontaminated by substitute materials adopted for the sole purpose of maintaining volume.

Here at Kerotest we are resolved to maintain the high standard of quality in all Kerotest Valves and Fittings that has won recognition and acceptance by every major producer of air conditioning and refrigeration equipment.

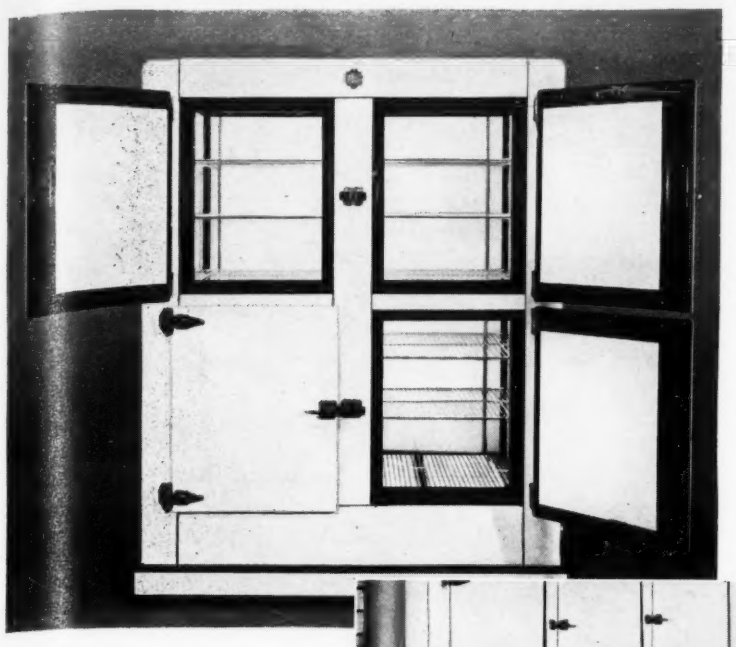
We offer no substitutes to maintain volume . . . but guarantee the same high quality for all Kerotest Valves and Fittings . . . in the maximum quantity we are enabled to produce.

KEROTEST MANUFACTURING COMPANY
PITTSBURGH · PENNSYLVANIA

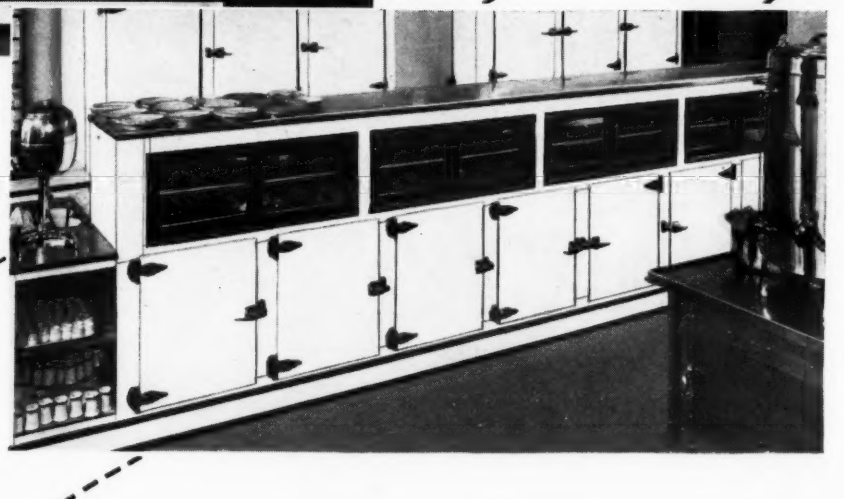
J. C. Strachan
General Sales Manager

KEROTEST

MANUFACTURERS OF TOP QUALITY VALVES AND FITTINGS FOR THE REFRIGERATION AND AIR CONDITIONING INDUSTRY



In hospitals and army camps this type of refrigerator fills a real need. It's air-conditioned for maximum efficiency



Pantry refrigerators like these are necessary in restaurants and hotels to prevent spoilage or food waste.

FOOD FOR NATIONAL DEFENSE

PROTECTED EVERYWHERE AGAINST WASTE BY

AIR-CONDITIONED

FRIEDRICH *Floating Air*

COMMERCIAL REFRIGERATORS

Modern bakeries depend a great deal on dough retarding and storage refrigerators as illustrated above.

The health of the nation is safeguarded by thousands of coolers or walk-in refrigerators.

Display refrigerators like these make possible amazing economies in time and food. They are an important part of the American standard of living.

FRIEDRICH'S 550 salesmen and 350 skilled refrigerator craftsmen are helping to defend the Nation's first-line defenders by safeguarding the Nation's food supply.

In army camps, on shipboard, in restaurants, hotels, hospitals, bakeries, in markets and grocery stores, commercial refrigerators have the vital job of protecting our very lives by protecting our foodstuffs.

☆ ☆ ☆

Friedrich commercial refrigerators, however, do more than "protect." Using an exclusive built-in air-conditioning system—Floating Air—**FRIEDRICH REFRIGERATORS ARE SAVING TONS OF FOOD ANNUALLY BY ELIMINATING EXCESSIVE SHRINKAGE AND DISCOLORATION.**

Foods are kept fresh days longer . . . and retain more of their essential vitamin content than is possible with ordinary refrigeration methods. Obviously, merchants profit greatly from this feature—but the Nation, in its all out campaign against waste, profits too,

☆ ☆ ☆

Friedrich Refrigerators have many other advantages that have a national as well as private profit importance. They are light-conditioned, for example, by Coolite, an exclusive Friedrich development that displays food brilliantly in all its rich natural colors. **YET COOLITE USES FAR LESS ELECTRIC CURRENT** than do ordinary lights.

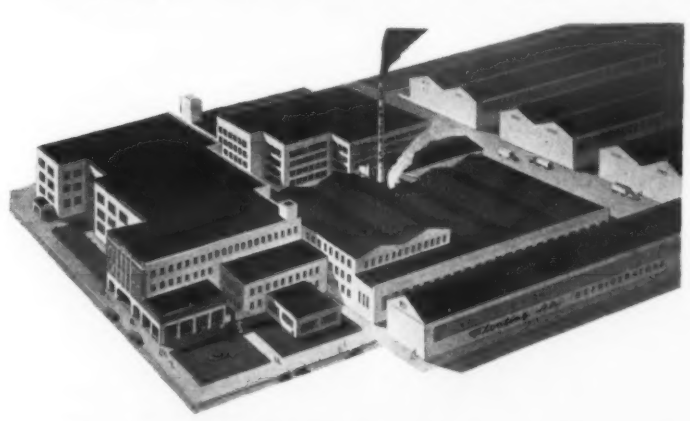
The users of Friedrich Refrigerators can put their **PROFITS INTO DEFENSE BONDS** rather than repairs, because Friedrich Refrigerators are built for long, trouble-free service by skilled craftsmen who have devoted their lives to the making of sturdier, stronger, more economical refrigerators.

☆ ☆ ☆

WRITE FOR FREE BOOKLET describing the complete line of air- and light-conditioned commercial refrigerators.

☆ ☆ ☆

Serving America for 58 years with the Best Commercial Refrigerators



ED FRIEDRICH SALES CORP.

Home Office: SAN ANTONIO, TEXAS

Representatives Everywhere

'Reasons For' Buying Air Conditioning Are Found To Be Chiefly Economic

Studies Also Show That Annual Operating Costs Are About 7% of the First Cost

BOSTON—"Economic compulsion" is the primary cause behind the desire for air conditioning, Realto E. Cherne, engineer for the Carrier Corp. of Syracuse, N. Y., declared in a discussion of "The Economics of Air Conditioning" at the second annual Air Conditioning Institute held at the Massachusetts Institute of Technology.

To guard against losing customers to competitors, the buyer is compelled, said Mr. Cherne:

"(1) to satisfy requirements which he finds essential to the conduct of his business, as in manufacture of rayon, candy, or cigarettes, and

"(2) to provide additional services which will produce an annual income greater than their annual cost and thereby increase the total annual return on his entire investment, as in the case of theaters, department stores, or machine shops where close tolerances are essential."

His own comfort and the social welfare of his employes may also influence the buyer, he added.

For his investment, Mr. Cherne declared, "he gets increased business, more business per customer, greater cleanliness, more work because his employes are comfortable, and better service to his customers since his employes are more cheerful."

He also gets "continuity of production, uniformity of product, increased production, reduction in accidents, and preservation of materials and product," Mr. Cherne continued.

Mr. Cherne outlined seven principal factors affecting first cost of an air conditioning system. They are quality of equipment, conditions to be maintained, the heat load in the space, degree of air cleaning required, degree of automatic control required, available space for apparatus, ducts, piping, etc., and the health and safety hazards involved.

"Honest cooperation between owner, architect, engineer, and contractor will insure good final results at the best price," he said. "Best price does not mean lowest price, but rather an overall consideration of investment, operating and maintenance costs; appearance; reliability; and quality and availability of future service work."

Information obtained in recent years is taking some of the guesswork out of computing operating costs, Mr. Cherne told institute members. "The average annual cost of power, water, steam, maintenance, repairs, and labor is about 7% of the first cost," he declared. "This percentage varies from about 5% for high-priced systems to about 10% for very inexpensive installations," he said.

Dome For Kansas City Cooling Would Have Aircraft 'Trap Door'

KANSAS CITY—Can you imagine all of Greater Kansas City covered by a huge glass dome and completely air conditioned, with a sprinkler system to regulate humidity and ultra violet ray lamps to replace sunlight on cloudy days?

Well, Walton R. L. Taylor, civic secretary of the K. C. Chamber of Commerce, can—and what's more he has outlined a proposal for the work to be done as a W.P.A. project and has suggested that it be commenced as soon as governmental approval can be obtained.

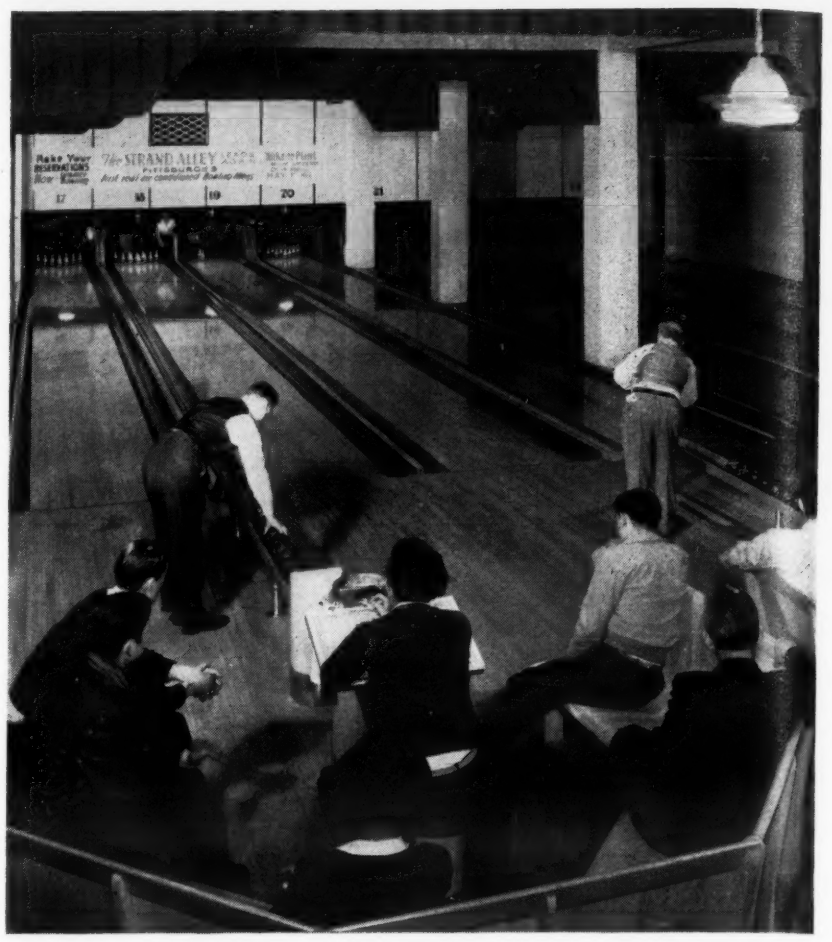
The proposal advanced by Mr. Taylor calls for erection of a huge glass dome over the entire metropolitan area. This dome would be supported on aluminum girders, and would house a gigantic air conditioning unit which would constantly regulate the city's temperature.

The vast weather dome would be equipped with trap doors to allow for the passage of airplanes.

Mr. Taylor carefully explained that the idea was not his own, but was first suggested to him while he was serving as assistant city manager of Norfolk, Va. At that time, he said, a Denver inventor sent him blueprints, estimates, and a complete prospectus of such a cooled zone.

On investigation, Mr. Taylor found that this inventor was confined in a Colorado state institution.

Year-Round Recreation For Workers



Equipped with a 10-hp. air conditioning system, the Strand Alleys, claiming to be Pittsburgh's first "real air conditioned bowling alleys," did not suffer the usual summer drop in patronage. Two York 5-hp. units supply 4,000 c.f.m. of air, which is delivered through six outlets located behind the foul line. Return air intakes are located at the opposite end of the alleys so smoke is blown away from bowlers.

Drug Chain Finds Air Conditioning Vast Aid In Its Surgical Belt Fitting Room

DALLAS, Tex.—Fitting of surgical and corrective belts, an important and profitable department of the Ervay and Main St. unit of the Skillen Co. drug store chain, has continued to increase in volume despite high summer temperatures, thanks to a 25-ton air conditioning system. Gains have also been noted in the rest of the drug store.

Besides permitting summer fittings by making customers more comfortable and eliminating perspiration, air conditioning has completely stopped loss from deterioration of rubber and elastic goods under intense summer heat, reports W. C. McKnight, manager and originator of this department. With rubber now on the priorities list, loss stoppage is highly important, Mr. McKnight believes.

15° F. DIFFERENTIAL

This department, with its series of fitting rooms, occupies the entire mezzanine floor of the drug store, where temperatures in summer would reach 106° F. ordinarily. The conditioning system, however, maintains a 15° differential between outdoor and indoor temperatures.

Two Carrier units are employed, a 10-hp. model and a 15-hp. unit. With such a breakdown of capacity the system may be operated at 40%, 60%, or 100% capacity as conditions warrant, making for economy of operation. An evaporative condenser is located in the basement.

GETS EXHAUST BENEFITS

Placing the evaporative condenser in the basement has accomplished quick flow of exhaust air from the store to the basement, Mr. McKnight says. This is desirable because the store's luncheon department has a large patronage, and odors of cooked foods and cooking itself were a problem before installation of air conditioning.

Outlining the benefits of air conditioning to the fitting department, Mr. McKnight remarked, "If you never have attempted to fit an elastic belt or garment on a person whose body was literally oozing perspiration, you wouldn't be likely to realize how impossible it would be to do a satisfactory job. Entirely apart from that side, you might get a customer up there one time, but you surely wouldn't have much reason to hope he or she would ever return.

DRYNESS A FACTOR

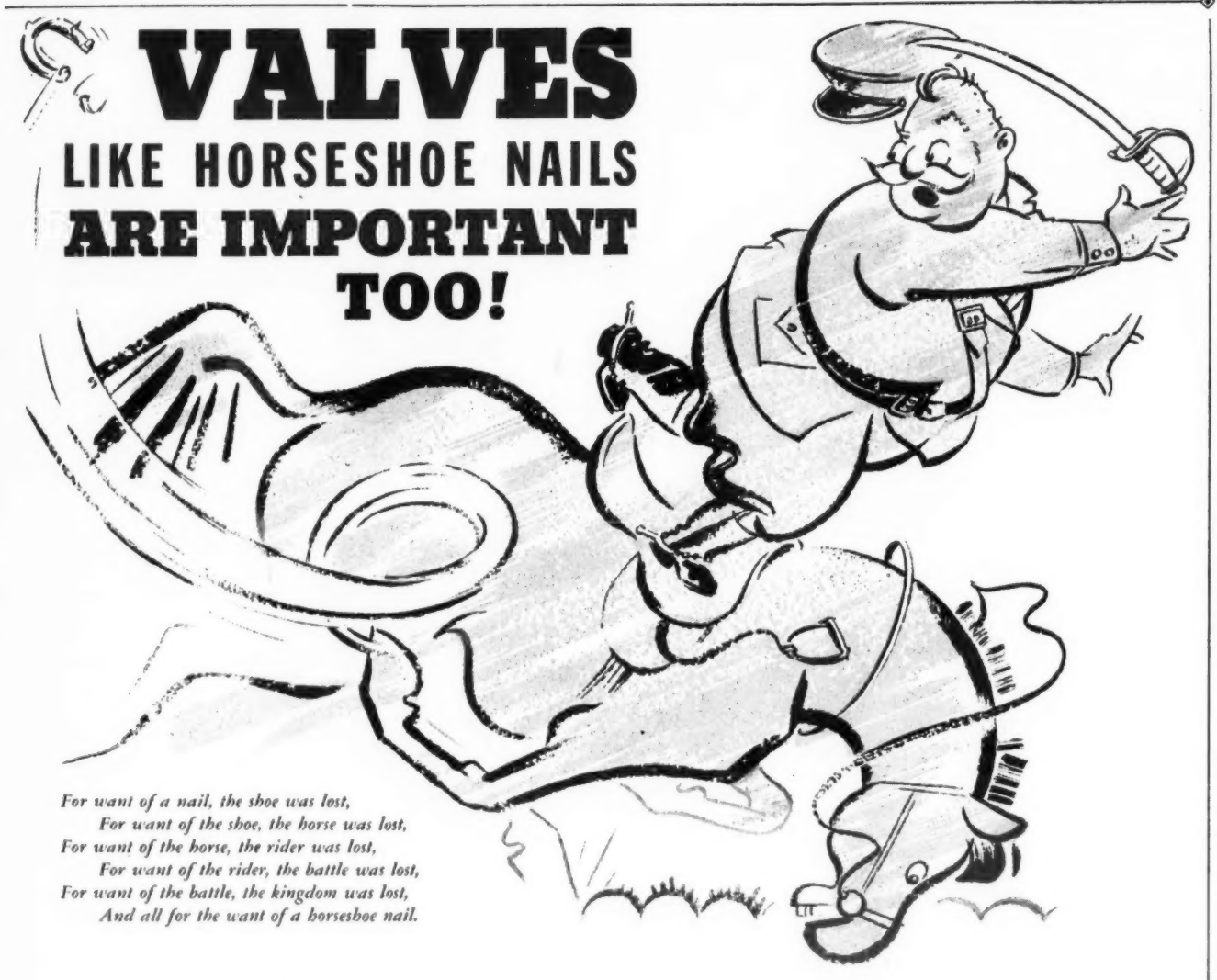
"With the conditioning system, we keep the store tempearture at 15° under outside temperature. Thus, if it is 100° outdoors, we have it at 85° inside. The person coming up to our fitting department in a very few minutes is cool and comfortable. His or her body soon is dry, and it is entirely possible to proceed to make a fitting which will give satisfaction.

"You know," Mr. McKnight continued, "I wish it were possible for me to have a women's public rest room and lounge installed up there. I know that we could boost our sales of such things as brassieres without a bit of effort. A cool place like that would bring in just the traffic which would buy such things."

A 'RIGHT' HUNCH

The fitting department is the only one operated by the Skillen chain, and is Mr. McKnight's "baby." He had been convinced that fitting of trusses, surgical, and corrective belts could and should be done scientifically and rigorously, much as prescriptions are filled. After receiving permission to institute this department, Mr. McKnight found that his hunch was right—correct and careful fitting brought in many customers from a widespread area. Mr. McKnight directs the fitting of men, while his sister, Miss Elizabeth McKnight, is in charge of the women's department.

VALVES LIKE HORSESHOE NAILS ARE IMPORTANT TOO!



For want of a nail, the shoe was lost,
For want of the shoe, the horse was lost,
For want of the horse, the rider was lost,
For want of the rider, the battle was lost,
For want of the battle, the kingdom was lost,
And all for the want of a horseshoe nail.

IN THIS greatest defense battle of the ages, all of us cannot manufacture planes, tanks or guns, but each of us can do our part, in our own small way, to keep the horseshoe nails of industry driven home where they'll do the most good.

Take thermostatic expansion valves for example . . . Sporlan valves are performing as perfectly in army camps, airplane plants and aboard ships as in the thousands of commercial refrigeration and air conditioning installations the country over. Hundreds of independent jobbers and thousands of service men are on the job night and day to see that refrigeration and air conditioning replacement parts and service are immediately available.

Important to defense? We think so. The food and health of millions of workers making defense equipment is as important today as the health of the selectees who are being trained to use it. In fact, like the famous horseshoe nail, if the defense workers are incapacitated by refrigeration and air conditioning failures, battles may be lost through lack of equipment.

You can Install SPORLAN VALVES *with Confidence!*

SPOEHRER-LANGE COMPANY

3725 COMMONWEALTH AVENUE • SAINT LOUIS, MISSOURI

FOOD WINS ALL WARS
REFRIGERATION—A NECESSITY

The ELECTRIMATIC Corp.

2100 Indiana Ave. Chicago, Ill.

Refrigeration Users Should Be Told What 50% Cut Means

(Continued from Page 4, Column 5)

frigeration is a defense item, and I feel that Washington grants this perfectly willingly. Frankly, I'm optimistic. We'll get the stuff—not as much as we got the first part of this year, but we'll get some anyway.

A. B. NEWTON, Minneapolis—What would restrictions in the refrigeration supply mean to the consumer? For example, the 50% cut. I asked several housewives about it and they didn't know what it would mean to them. I asked a butcher what would happen if he couldn't get repairs. His attitude was that "we used to be able to get along, we can get along again."

We must get a connected story of the industry across to the users of refrigeration. Suggestions: (1) Service men can tell consumers every chance they get what it would mean not to have refrigeration. He is usually the one who is on the job when the consumer is out of it. He finds himself in an excellent position to enlarge on what it means not to have refrigeration. (2) I believe concerted action from all employes in writing to their senators is effective. From personal acquaintance with senators I know that although they may not read all the mail, their secretaries will tell them just about what subject gets the most mail. If we give our service men, factory employes, etc. a coordinated story as to what commercial refrigeration does for food distribution—just a few facts—and urge them to write in to their senators, it might be a fairly effective step. (3) The radio can be used as a means of spreading the gospel of refrigeration. (4) Local newspaper action: There are a number of local trade associations and factory representatives who would underwrite a coordinated type of action to show the public through advertising space and column space in the local newspapers the importance of refrigeration. This story should be written up in advance, so that everyone would tell the same story. This might be a job for the NEWS.

FRANK M. BENNETT, Canton, Ohio—What we need is a slogan: "Refrigeration for the Defense of Public Health and Food Supply." Get it over to the public. Perhaps the service men could deliver stickers to their customers and paste them up in markets, etc. Some brief slogan like "Refrigeration for Defense."

By the way, how many people here have gotten answers from their Congressmen?

CLAUDE BRUNTON, Mechanical Refrigeration Service, Huntington, W. Va.—Everyone passes the buck. No one stands on his own feet. Every manufacturer and manufacturer's agent, every jobber and jobber's agent should carry it home to the service man and have him do a bit of selling. So far the service man hasn't done anything because he has always waited for someone else to do his work, and get his stuff for him. For instance, I know

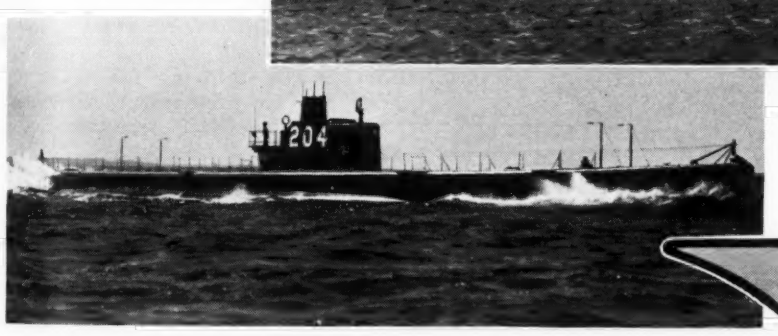
(Continued on Page 10, Column 3)

Discussions Continue After Meeting

Ted Glou (in sports coat) of Central Service Supply Co., Syracuse, N. Y., wholesaler, is probably telling again of how he placed orders with three different firms to assure delivery—and they all came through at once—for the benefit of (left to right) George Allen of Mueller Brass Co.; Horace Laney, Buffalo advertising agent; Dale Mericle of the News staff.

EQUALLY VITAL FOR VICTORY!

National Defense



Official U. S. Navy Photographs

The Armed Forces of the United States

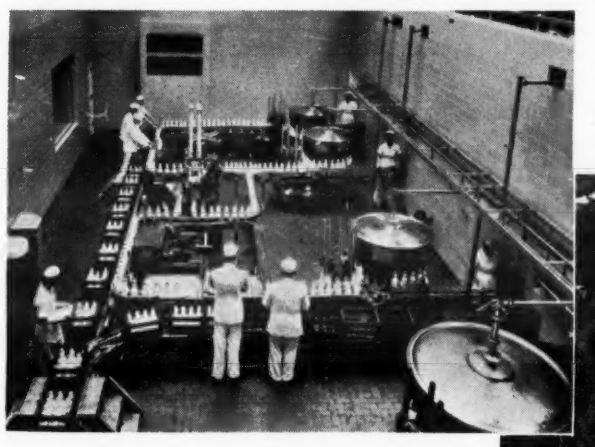
Alco Thermo Valves and other Alco Refrigerant Controls are widely used by the United States Navy. In surface vessels and in submarines, now at sea or in the process of construction, Alco Valves are playing an active part in the defense of America.

Alco Valves assure dependable control of the refrigeration and air conditioning systems of the United States fleet—a vital factor in the efficiency of our fighting ships and in the welfare of their crews.

In bases and cantonments of the Army too, Alco Refrigerant Controls have the important job of maintaining accurate control of the refrigeration, cooling and freezing of foodstuffs for the Army's personnel.

Alco is proud of the opportunity to serve our country in this manner. Much of our present production is now being utilized directly by the armed forces of America.

Modern Refrigeration



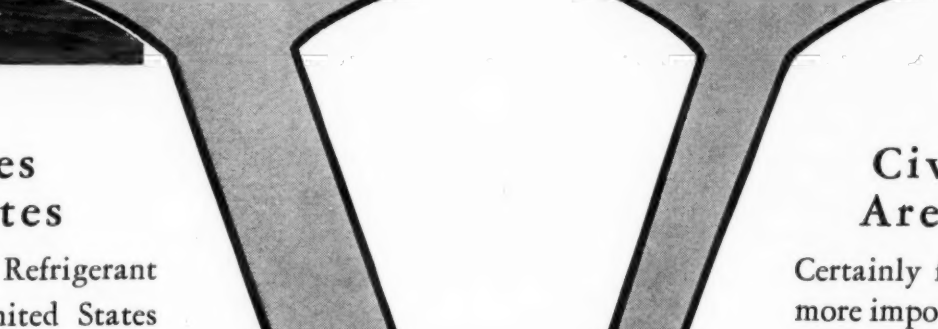
Civilian Requirements Are No Less Important

Certainly few aspects of our national defense are more important than the maintenance of the health and welfare of our people—in fact, *refrigeration is our national defense* against food waste and food spoilage that endangers health.

The preservation of America's food supply depends upon proper refrigeration facilities. The transportation, processing and storage of the nation's food must rely upon modern mechanical refrigeration.

Today, *more* refrigeration is urgently needed. Increased civilian demand for perishable foods has resulted in the construction of new food stores to serve the shifting population of workers on defense projects. Old, obsolete refrigeration systems are in need of replacement. The demand is here now, and it is urgent.

For years, the development of Alco Refrigerant Controls and their record of accuracy and dependability has been an important factor in the progress of the commercial refrigeration industry. Today Alco joins with this industry in emphasizing the importance of commercial refrigeration as a vital part of our defense effort.



ALCO VALVE COMPANY

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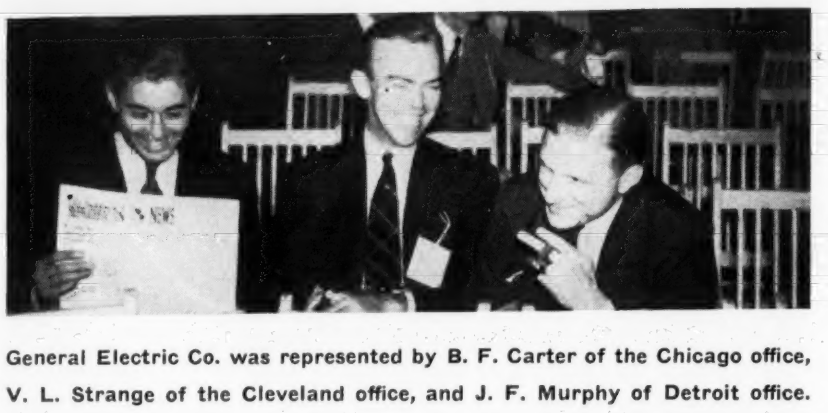
ALCO *Engineered Refrigerant Controls*

THE STANDARD OF THE INDUSTRY

They Can Still Smile



General Electric Co. was represented by B. F. Carter of the Chicago office, V. L. Strange of the Cleveland office, and J. F. Murphy of Detroit office.

Frank Smith (center) of Tecumseh Products Co., Tecumseh, Mich. is pretty serious about the situation but E. M. Billings and Jim Hood of Ansul Chemical Co., Marinette, Wis., find something to laugh about.

Numerous Ways Are Suggested To Reach 'Washington Powers'

(Continued from Page 9, Column 3)

that railroad trains get "Freon" for their passenger coaches when they admit that only 2 or 3% of their passengers are sailors or soldiers.

The service men have got to get behind it, too. Don't let the job be put on the manufacturer and jobber entirely. The service men have got to be whipped up—through articles in periodicals, or in bulletins sent out by manufacturers to their service men. And have a meeting and **let the public know it.** The service man is in touch with those who buy and sell.

FRED HOVEY, JR., National Ref. Supply Jobbers Assn.—Why not have the entire industry close down for a day or two? Then the public would realize refrigeration's importance. I don't know whether this would be legal. I haven't consulted anyone as to its legality.

H. W. SMALL, Thermal Co.—What about hiring a press agent and establish a National Refrigeration Day and have the whole industry shut down for that day?

GEORGE ALLEN, Mueller Brass, Port Huron—The commercial representatives in Washington are the ones who see the OPM men. We are not going to have enough material to do the business next year that we did last year. Let's draw up an industry-wide program of the absolute least we can get along with and send that to OPM.

J. S. FORBES—If we are going to have these great big defense programs, then labor has got to work a little more than they do today. Prolong the work week to six days. It's too short now. Some of the defense orders are placed for 1943 use. What we should do is dole out the stuff between immediate defense requirements and industrial requirements. If we are down to basic materials, we will produce more stuff and the two forces (longer work week and short term orders) will come together. They do not need the stuff until 1944. Contracts should be made more reasonable. Make 1/10 for urgent consumption and leave the 9/10 for when it is needed.

USE GOVERNS SHIPMENTS

GEORGE ALLEN—OPM directed us not to make shipments (even though A-1 priority) unless the customer is going to use the material in the month in which it is to be shipped. No shipments are to be made, whether to defense or non-defense contracts. This order was signed by Stettinius. OPM has turned down Navy bids for copper, because they had enough for September. Stettinius said specifically that when all defense orders are taken care of, the remaining materials could be used for non-defense orders.

F. S. LANGSENKAMP, Indianapolis—Steel has an A-9 rating. We should pattern ourselves after someone who has been successful in getting a good rating. We want a definite priority assigned to this industry. I move that George Taubeneck edit all the thoughts that have been given at this meeting and send it to the secretaries of all organizations affected by refrigeration, who will pass this information to everyone and advise them whom to write to.

J. M. OBERC—Who is going to pay for it? George already has his hands full trying to get some advertising.

WHAT DEALERS SAY

H. L. ASHWORTH, Wisconsin Radio, Refrigeration & Appliance Assn.—I represent the dealers and distributors of Milwaukee. I came because Mr. Taubeneck's voice is the first whisper in behalf of distributors and dealers of major appliances. A number of distributors say that if they are reduced below 50% they will have to go out of the picture entirely. I checked with a number of retail dealers and was surprised by the lack of concern shown by these retailers. I asked them "What would you do if you were cut off?" The answer was that they would sell something else—garden tools, household equipment. This is interesting because it shows that the dealers are thinking not what they can do to preserve their present business but what substitute business they can take on.

These are some of my ideas: (1) The distributor or dealer cannot depend very much on the manufacturer of appliances to do much for him. The manufacturer is on a spot and can't help. The government shoves defense contracts on him. While he is sympathetic to the dealer, there isn't much he can do. If anything must be done, the initiative must come from the distributors and dealers—and it must be nationwide.

(2) An appeal to Washington on the basis of mechanical refrigeration being essential to the health and food preservation of the nation will be disposed of in Washington in a few seconds with the words "Return to the old ice box." **But** it is a good argument to maintain that the refrigeration industry is essential to defense on the basis of public welfare and public morale.

WILL 'GO TO BAT'

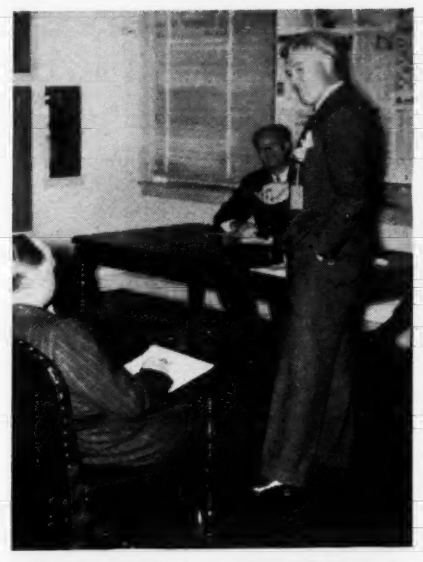
(3) In Milwaukee we have two unions, salesmen and servicemen, which are strong A.F. of L. unions and ready to go to bat. These men in Milwaukee are enough interested in protecting their livelihood to stir up an argument to the effect that the future welfare of a great many depends on their keeping in business.

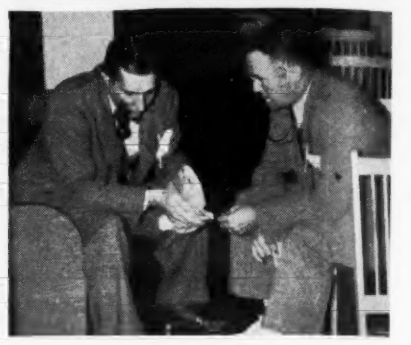
(4) A movement should be organized and presented to every state and each state should carry it out. Do not write to your individual senators and congressmen. Appliance people in each state should compile plenty of letters and should take it to their own delegation of senators and representatives in Washington. Present it to all rather than the individuals. If that were done in every state and if every state's congressmen were to go to bat in behalf of assisting the industry, it would be effective. It should be done by petitions of two types (a) signed by people earning their livelihood in refrigeration distributing and retailing, and (b) by housewives and other users of mechanical refrigeration.

H. C. LE VINE—We must get an industry rating regardless of how essential we claim we are. We know we can't go on at the 1941 rate. We must fight for our very existence. Don't ask for the whole world, but try to get at least a

(Continued on Page 11, Column 1)

Informality Marks Town Meeting





(Upper left) Howard Hubbell, Brass & Copper Sales Co., St. Louis supply jobber, tells the crowd not to worry about anything, that Washington is going to provide the industry with what it needs and wants. (Upper right) Those who wanted to talk spoke from their seats, or got up and moved around, in the truly informal spirit of the Town Hall meeting. Here E. A. Vallee, vice president, Automatic Products Co., Milwaukee, and president, Refrigeration Equipment Manufacturers Association (Rema), rests against a pillar as he answers a question posed by Huntington W. Small, the Thermal Co., St. Paul, who is comfortably ensconced on a lounge. (Lower left) R. W. Gifford, vice president of Norge (center), discusses the situation with James W. McCandless (left) and C. M. Jickling (right) both of R. W. Wolfe & Associates, Detroit. (Lower right) In a deep conference are Jack Knighton of Servel, Inc. (left) and Geo. S. Jones (right), Servel vice president.

THE INSIDE TELLS ANOTHER STORY

Discovery, development, evolution...in the domestic refrigeration industry these steps to perfection have been big and dramatic. The gleaming, efficient home refrigerator of 1941 is a very distant cousin of the homely electric "ice-box" of a decade ago.

But when you look inside today's refrigerator, when you look into the cooling unit, you most often discover a curious thing. The refrigerant is quite likely to be Sulphur Dioxide—the same refrigerant that has been cooling home refrigerators since the industry was born.

Why? Because *Sulphur Dioxide is still the best refrigerant yet developed for household use.*

SO_2 won't burn, it won't explode. (In fact, it has fire-extinguishing properties.) SO_2 lends itself to perfect lubrication. It is safe, because its pungent odor serves as its own unmistakable warning agent. And this very odor makes possible leak detection a simple service operation.

Ansul, as pioneers in the production of Sulphur Dioxide, offers you a gas that is clean, pure, and *dry*. Every cylinder bears a laboratory-analysis tag attesting to this fact.

Throughout the nation, Ansul Jobbers with complete stocks are ready to serve you better with Ansul SO_2. If you do not know the Ansul Jobber in your region, write and let us tell you.

AC-36

Sulphur Dioxide by ANSUL

ANSUL CHEMICAL COMPANY • MARINETTE, WIS.

ANSUL METHYL CHLORIDE . ANSUL ICE-X . AGENTS FOR KINETIC'S "FREON-12"

THERE IS AN ANSUL JOBBER NEAR YOU READY TO SERVE YOU BETTER

'Dealers Must Tell Washington Their Place In Industry'

(Continued from Page 10, Column 5)

reasonably decent industry rating. That would be a starting point. Somebody has got to pay for this. AIR CONDITIONING & REFRIGERATION NEWS should not have to pay for it. We should be willing to contribute our share towards maintaining some sort of representation to help in securing an industry rating. Then our committees, city, state, or nationwide, should be formed to carry out programs which can be designed by the people who should know about ratings.

JOHN A. WHITE, John A. White Distributing Co., Grand Rapids—I don't believe we can get any place by fighting. We must get what we want in Washington. I suggest a sort of chamber of commerce: "Refrigeration Equipment Chamber of Commerce" to be formed nationally, to take our problems to Washington. The aeronautical industry has formed a similar chamber of commerce.

CUT DOWN MODELS

H. G. BOGART—The whole industry should agree, or settle on an agreement, to cut down the number of models. Get the industry to settle on a certain number of machines—that would be a gesture.

E. T. MURPHY, Carrier, Syracuse—I have been told it would be strictly illegal for the industry to iniate a move to cut down the number of models or sizes. I was told this by OPM. But if OPM made the demand rather than the industry, the number could be cut.

W. D. KEEFE, Fedders, Buffalo—I want to thank Mr. Taubeneck for calling this meeting. He realizes that the problems of the coil manufacturer are bad and numerous, which has been brought about by reasons with which we are familiar. It is impossible to ship coils sometimes because of the difficult situation surrounding screw machine parts. There is a shortage of small parts due to the situation in copper.

As Hubbell said, it looks very encouraging, but there is nothing definite established as yet, possibly because the machinery they are trying to set up, that they are willing to set up, isn't perfected yet. And just as soon as it is established, it will be a little more encouraging than at the moment. Sorry I haven't more data.

VALLEE EXPLAINS

E. A. VALLEE, Automatic Products, Milwaukee — Sixty-nine men representing the industry went down to the meeting in Washington last Thursday. There were eight subcommittees. But distribution has no part in the plan, they were told. It was all for the manufacturers. It is up to the wholesaler to get in and pitch. Everyone has to do his part. I think that everyone in the industry should be assessed a given amount of money and put on a real publicity campaign, over the radio, in newspapers, etc., to explain to the public what refrigeration does for the nation. So far we have done a terrible job of publicity. So few people seem to know what refrigeration really is, or why it is so important to national welfare. If we had done a better job of publicity six months ago, we would not be in the fix we are in now.

J. M. OBERC—Is there anything the industry can do to help this thing along, to get some action now? Are we wasting our time? Shouldn't we be doing something to expedite this?

T. I. GLOU, Central Service Supply—George Allen and Hubbell are too optimistic. I wrote to OPM and got back 50 forms of PD-1 asking for reasons why I want A-10 rating. It's a lot of red tape. We should prove once and for all that refrigeration is essential.

I came to Detroit to find out what I could do to help. I want to know what we can plan on and how we can get materials. It's best to play ball if possible, otherwise we must fight. How can we keep our business intact? The most important thing is to find out what is best to do—and then do it.

E. A. VALLEE, Automatic Products—We must go to Washington. The only solution is to work in Washington. The further we go along, the more we are accomplishing. We started in the dark. Now we are getting along better, we are getting better cooperation. They are understanding what we are trying to do. We have had two jobs to do in Washington—to educate them as to the facts of refrigeration, and to make them see the importance of refrigeration to the nation.

E. S. WRIGHT, Bonded Ref. Service Assoc.—Why aren't there service men, jobbers, dealers, and distributors on this committee in Washington?

J. M. OBERC—What can we do, what can we contribute financially and physically to accelerate this thing? We must get a balanced ration. Defense comes first, but unity is important. Rema is operating and doing something, the air conditioning fellows are doing something else, the copper men are doing something. The jobber or distributor is the middle man. What can we do to get the whole thing together? Because one is satisfied doesn't mean that all are satisfied. Should we form an association?

W. C. ALLEN, Modern Equipment, Defiance, Ohio—Has the chart in this issue of the NEWS been explained? There seems to be considerable confusion here. I have been pessimistic up to this point. I have been to Washington to OPACS and OPM meetings, and the answer is "Go home and get some defense work."

A week ago last Saturday 69 manufacturers representing all cross-sections of the industry received a command telegram requesting their presence at a meeting to be held in Washington last Thursday. The ray of hope was that all the effort that has been put forth by the different industry groups prior to last Thursday has developed in the Office of Production Management until this industry is now classified as an essential industry. Inasmuch as we have a committee, we are an essential industry.

We sat from 9 to 5:20 listening to a lot of government men. The same things were repeated in the afternoon by C. W. Shearman who is the representative of OPM. He is a worthy government man and advisory chairman of this industry, and says that if we present a good enough story to him that he in turn will give it to his chief and try to secure for this industry a high civilian rating.

A metals man from the Priorities office told us what might be available in 1942, what would be the scarce metals. Aluminum, none. 300,000 tons of copper would be available for civilian use. If there is that much available, we should do a job on that committee and get a high civilian rating, and thus get a share.

After the main meeting broke up,

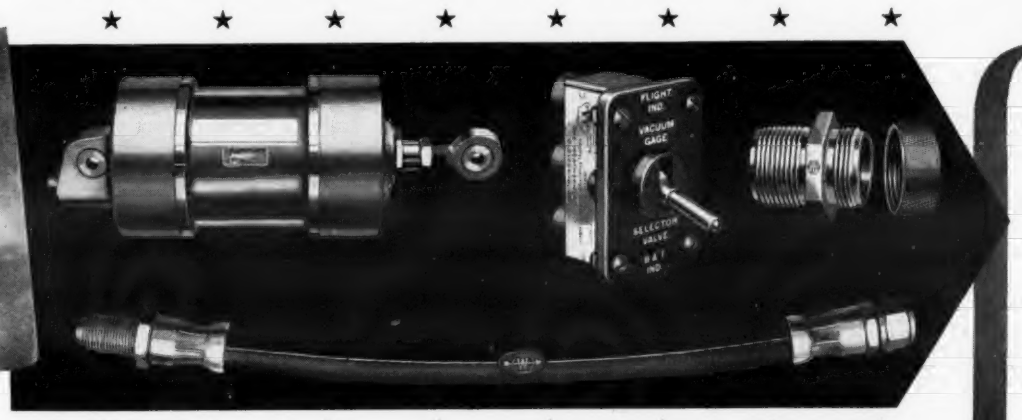
(Concluded on Page 12, Column 1)

WEATHERHEAD

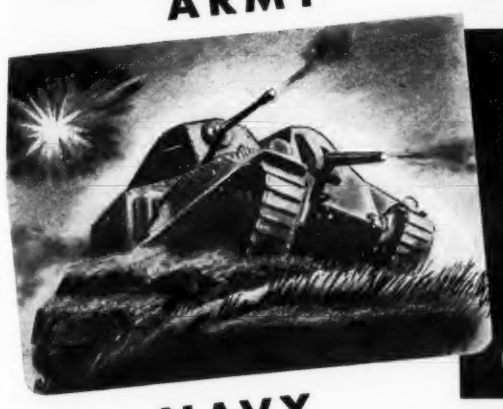
Serves

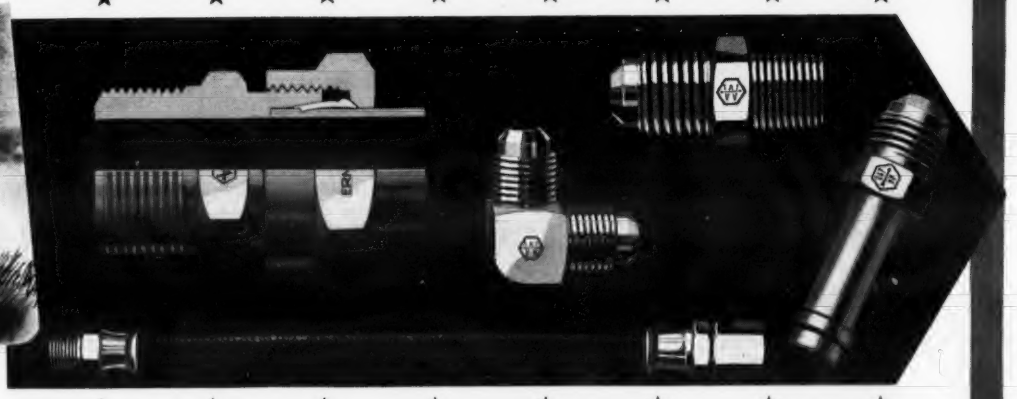
Early in the beginnings of the present emergency, Weatherhead began to gear its production to defense needs. Today, a large part of Weatherhead facilities is being devoted to producing equipment essential to the national defense program.

AIR SERVICE



ARMY





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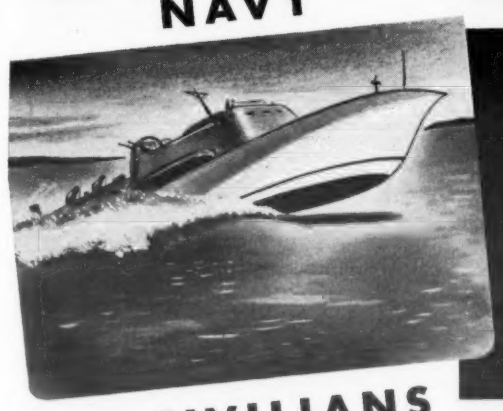
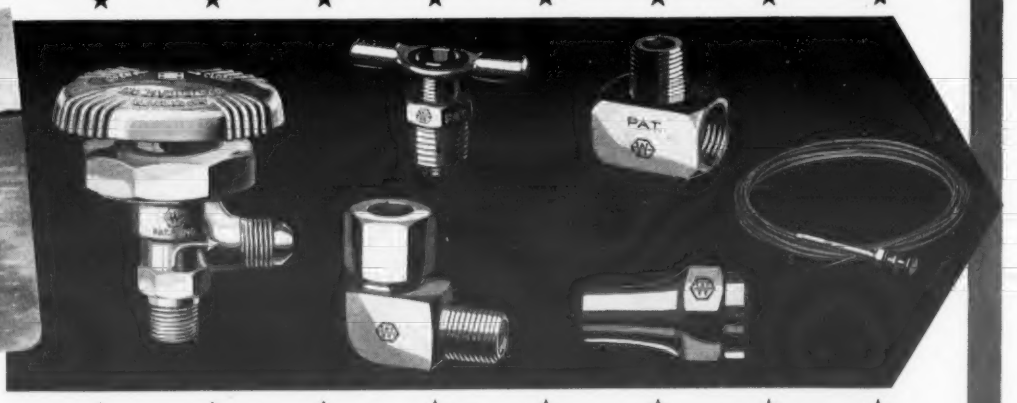
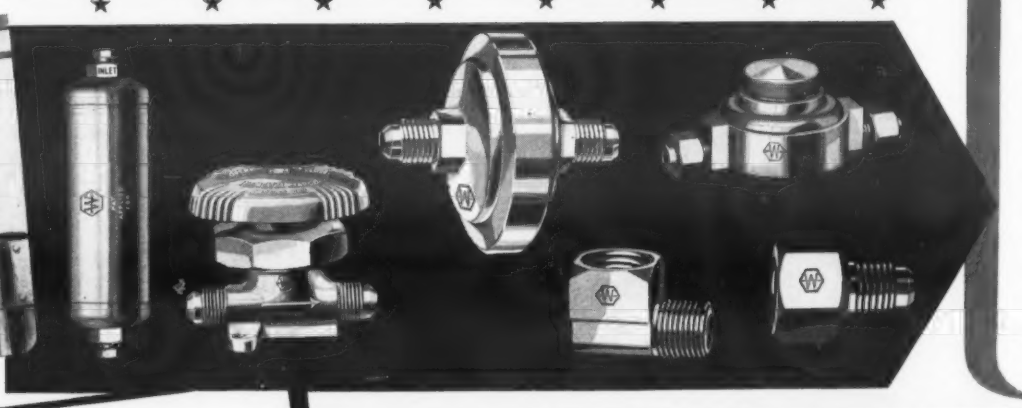




and CIVILIANS



★ ★ ★ ★ ★

FOR THE AIR SERVICE

Weatherhead parts include flexible hose assemblies, pipe, tube, and conduit fittings, hydraulic cylinders and vacuum selector valves.

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FOR THE ARMY

Weatherhead supplies bomb fuses, automotive fittings, flexible fuel lines, and Ermeto safety fittings.

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FOR THE NAVY

Weatherhead hose and fittings go into warships, submarines, mosquito fleets and navy aircraft.

★ ★ ★ ★ ★

FOR CIVILIANS

Weatherhead has long been a leading supplier of flexible fuel lines and fittings to the automotive industry as well as a producer of valves, fittings, dryers, strainers, manifolds and receivers for refrigerating equipment.

While priorities arbitrarily regulate the shipment of many Weatherhead products, we are, never-the-less, keenly appreciative of responsibility to our many customers who are not engaged in defense work. Your orders in the past enabled Weatherhead to attain its present place in industry and to be in a position to supply defense needs. We propose to serve you on orders for Weatherhead equipment in every way possible. We do, however, have to ask your indulgence when immediate shipments cannot be made.

The WEATHERHEAD Co.

CLEVELAND, OHIO

What Manufacturers Learned In Meeting With the OPM

(Concluded from Page 11, Column 5)

the individual committees went into session until 12:30 in the morning. In the NEWS you will find the names of the men listed on these subcommittees. I was on a committee. One of our jobs is to try to collect some statistics so that we can give Mr. Shearman a story as to why we are an essential industry. Every manufacturers' trade association secretary was sent a telegram advising him that by the next day he would receive a letter and questionnaire that he was to release to the membership of his trade association. The questionnaire was sent out by the office Monday, and to date we have had no replies to it. If you get that questionnaire, **get the answer in the mail quickly** so that the committee of nine men will have some kind of data to give to Mr. Shearman showing why we are a vital industry. Answer your questionnaires, so that the committee can give their information to Washington.

A question was asked on the floor: Were distributors and service people included in this committee? The answer was: No. It is strictly a manufacturers committee. What the wholesaler needs is a committee to go down to OPM and sell them on your economic importance. The next step is distribution. Service men should find out why they are important. Wholesalers are not **doing** anything. Wholesalers must go to Washington and fight their own battles. Appoint a committee of jobbers. Go down and make your story known. I think the thing has already been started.

Manufacturers, when you get a request for information, give us this information and the men on the committee will work for you.

E. S. WRIGHT, Bonded Ref. Service Assoc.—My work is commercial. The jobbers who go to Washington will have to have data showing why they are important. The service man is the one who is the friend of the consumer.

FRED HOVEY, JR., Jobbers Assn.—I represent the jobbers association and we have sent men to Washington. We have spent a lot of money for our size in Washington. For a small organization, we did our part—at least we were down there. We have told our story. What should we have done? What can we do now? Could we gain anything by sending more men down?

JOHN A. WHITE, John A. White Distr. Co., Grand Rapids—I feel that we are beginning to agree—that we as distributors must tell the story that refrigeration is an essential industry. OPM is concerned with the allocation of those materials in the various fields and the best possible way of distributing them. There hasn't been enough attention given to the jobbers, distributors, retailers, service men, but rather the attention has been centered on the manufacturers. If we get the story over that refrigeration is one of the essential industries, then the distributor, service man, jobber, and dealer will automatically be taken care of. It is much more important to sell the fact that refrigeration is an essential industry than that the jobber is an important branch of refrigeration. We need a united front. Get across the fact that refrigeration is an important industry—not that each component part is an important part of the industry.

JAMES W. MC CANDLESS, Detroit—Teach the jobber the lesson of the necessity of refrigeration. Three suggestions have already been made that a committee be appointed to voice the essential character of the industry. If this campaign were properly conducted, all manufacturers, distributors, and jobbers would cooperate with it. Each jobber in the city could promote it. We have the mind, but we need a tongue. We must get a voice.

F. S. LANGSENKAMP—I have jotted down six suggestions which have come to me while I've listened to the ideas brought out in this meeting.

(1) George Taubeneck to edit the material given at this meeting.

(2) This edited material to be given to a committee appointed at this meeting.

(3) This committee to contact some organization—such as the steel warehouse—that already has a rating, to find out their method of procedure.

(4) When this is found out, the edited material is to be sent to all organizations depending on refrigeration for their existence (grocers, bakers, ice cream manufacturers, service men, parts manufacturers, jobbers, etc.) with instructions to write to the party the above committee has found can do us the most good.

(5) Two weeks after this is issued the committee will contact the OPM office to get a hearing on a definite priority rating for the industry as regards commercial refrigeration.

H. C. LE VINE—The public must be educated to the value of refrigeration. We need to do something to get the industry represented before the powers that be in Washington. We must do it now. Two lines of action have been suggested, and we must get both programs started immediately. We need proper publicity and education. And we must have education.

G. R. WHIPPO, Cleveland—We have one customer—the group in Washington who is going to allocate materials. What we have to do is to determine whether refrigeration is essential and if so, how essential. We are after some sort of a blanket rating. The men in Washington are not interested in distribution. They should be but they are not.

Have a committee of distributors go to Washington. It's the only thing that will help. We have only one customer to sell.

H. L. ASHWORTH, Wis. Radio, Ref. & Appl. Assoc.—I propose that Mr. Taubeneck take care of the Washington angle of the committee's work. This committee can make the contacts in Washington. And at the same time it would send out a plan of procedure to get the folks back home in each state to take action. Some individual organization or distributors' group in each state to carry out a uniform program of activities in support of that plan of procedure. Each committee to present the case to Washington and to present it to the folks back home.

JOHN K. KNIGHTON, New York—Whenever we talk of the distributing organizations, we have used the ratio of 3 to 1—three employes in distribution to one in manufacturing. We are vitally interested. It would appear today that if this group would have a committee representing jobbers, distributors, retailers, and service men, which would go to Washington this week on an informative basis and explain to those men the importance to defense and non-defense of refrigeration. They must point to the fact that you need priorities for materials.

R. J. REHWINKEL, Kendallville, Ind.—I think we should give a vote of thanks to George Taubeneck and the NEWS for the initiative they have taken in behalf of the refrigeration industry—for calling this meeting and for their hospitality.

Representatives of some Detroit dealerships lined up in the back row. Left to right, they are: C. L. Sivyer and William Gershenson, Ned's Auto Supply Co.; Samuel St. Pierre, Kozy Kitchens, Inc.; and Louis Richards, Nome Appliance Co.

is refrigeration essential?

If the health of the nation is important . . . if the prevention of food spoilage is a vital necessity . . . if waste is a direct blow at defense . . . then there can be no question but that refrigeration *is* essential . . . emphatically so! . . . Today, America literally lives out of a refrigerator. The uninterrupted flow of perishable foods from producer, through distributor, to consumer depends solely on the continuous functioning of refrigeration . . . mechanical refrigeration. And, there is no available substitute . . . The unprecedented need for refrigeration by our armed forces was bound to cause a scarcity of parts and materials for civilian use . . . but, the maintenance of existing refrigeration equipment, at least, is a MUST . . . *Defense demands it!*

HENRY VALVE CO. TRADE MARK

PACKLESS AND PACKED VALVES · STRAINERS · DRYERS
FOR REFRIGERATION AND AIR CONDITIONING · ALSO
AMMONIA VALVES AND FORGED STEEL FITTINGS

1001 No. SPAULDING AVENUE · CHICAGO

HENRY VALVE COMPANY

John Marshall (center) and Arnold Dessau (right) of Melchior, Armstrong, Dessau Co., large refrigeration supply jobbing firm with headquarters at Ridgefield, N. J., and many branches throughout the east, were among the early arrivals for the meeting.

Harvard Depends on Air Conditioning To Preserve Rare Books, Manuscripts

CAMBRIDGE, Mass.—Rare books and manuscripts, more than 100,000 of them, will be preserved for future generations, it is hoped, by the air conditioning system to be installed by Buerkel & Co. of Boston in the Harvard university rare book library now under construction here.

The building, 60 by 120 feet, consists of six floors, three above ground level and three below. Its thick walls are waterproofed and insulated with 1 inch of cork. Double-glazed windows and glass wool in the roof provide further insulation.

Air conditioning equipment includes an electrostatic air cleaner, a spray chamber with misting nozzles, a preheating coil, direct expansion cooling coils, heating coils, odor absorbers, and a 30-ton, two-step "Freon-12" compressor. Automatic controls of the pneumatic type will be used. Well water at 55° F. will be supplied to the precooling coil.

Design conditions call for summer temperatures of 78° to 80° F. maximum dry bulb with 45% relative humidity, 5% variation being permitted. Winter temperatures will be 70° to 72° F. dry bulb, the relative humidity remaining the same all year around.

Two main air supply ducts are planned, one for the three upper floors and one for the three below ground. The lower duct will include a booster heater. Branch ducts will have volume control dampers with indicating and locking quadrants.

Supply and return air ducts will be lined for a distance of 20 feet in the tunnels with a sound absorption material, as will be most of the inlet register boxes and ducts over the building. Ducts are to be equipped with fusible links and self-closing fire dampers.

Both adjustable wall grilles and circular ceiling outlets will be used. Return air will be drawn through registers located near the floor. Most rooms will have thermostats controlling the pneumatic convector valves.

A dewpoint thermostat on the leaving side of the direct expansion cooling coil will control the compressor starter, precooling coil water valves, and the unloader device.

A direct humidistat will control the water valve on the humidifier sprays during winter and the precooler water valve and compressor control in summer. Controls can be changed from winter to summer operation by a positive acting automatic return air thermostat.

Return air, fire, and bypass dampers will be regulated during summer months by a remote adjustable duct thermostat which is, in turn, controlled by an outside air pilot thermostat. Static pressure regulator in the fan discharge duct will control the air volume damper.

Conditioning Improves Accuracy of Parts

LOS ANGELES—Inaccuracies in the manufacture of precision parts for pumps and oil tools, resulting from arbitrary allowances for contraction and expansion of tool steel as the temperature changed, have been eliminated at the Kobe, Inc. foundry here by the installation of an all-year-around air conditioning system.

Temperatures in this one department of the foundry are now held to a constant 70° F., with a permitted variation of ½°, by an automatic heating and cooling plant. This prevents expansion and contraction of the metal. Air is filtered by an electrostatic air cleaner. Several step controls are incorporated in the installation to permit use of only part of the cooling system during periods of medium weather.

The air conditioning system was installed by Western Air Conditioning & Refrigeration Co., Westinghouse distributor.

'York Plan' Industrialists Study Gun Plans

Studying army plans to prepare a collective bid under the "York Plan" are the following executives of York, Pa. industrial concerns: (left to right) P. P. Stock, York Ice Machinery Corp.; H. C. Bentzel, York; Burwell B. Smith, S. Morgan Smith Co.; Warren C. Bulette, Brandt-Warner Mfg. Co.; William S. Shipley, York; Marshall G. Munce, York; Beauchamp Smith and D. C. DeVine, Smith Co.; T. C. Cottrell, York; M. L. Gotwalt, Read Mchy. Co.; Edward Fisher, A. B. Farquhar Co.

Rubber Shortage Depends On Far East Crisis

WASHINGTON, D. C.—Civilian use of crude rubber in the United States probably will be restricted until the position in the Pacific is clarified, with a shortage of domestic supplies expected to be felt this month for the first time, reports the Department of Commerce.

Foreign production of rubber has been short of capacity, and for the early months of this year lower than permissible exports.

Shipments of crude rubber from producing regions to all consuming countries in the first five months of this year were 592,100 long tons, against 542,200 in 1940. This is a 9% increase, but it is not in line with the increase in the percentage of permissible exports this year as against 1940—respective half-year quotas being 100 as to 80.

Malayan shipments, for instance, were 16,514 tons lower than the permissible quota export in the first five months of the year; the Netherlands Indies exports were lower by 24,849 tons; and shipments from Ceylon were 13,099 tons short of the limit.

Estimates based on Department of Commerce data and trade statistics indicate a probable consumption of 316,327 long tons of crude rubber in the last half of the current year, subject to change when final priorities and allocation figures are released.

Materials Shortages May Hit MKB Promotions

NEW YORK CITY—Distributors and dealers who intend to use Modern Kitchen Bureau materials in their fall electric range and water heater campaigns, but who have not as yet placed their orders for promotional material, are urged to do so at once by H. L. Martin, bureau manager.

Recent price increases have made it impossible to reproduce the campaign materials at present prices, Mr. Martin says. Prices given in the MKB plan book will hold only as long as materials now available last. This is true particularly of the one-minute dramatized radio announcements.

There Is No Substitute For Experience

A NATION...
LIKE AN ARMY...
TRAVELS on its STOMACH

HANNIBAL'S warriors drove herds of live oxen on their long marches . . . and killed their meat as they needed it.

Caesar's legions carried salt pork into Gaul.

Grant's army lived (and died) on a diet of canned "corn willy."

But today—modern automatic refrigeration protects the food supplies of America's armed forces and civilian population alike. Modern automatic refrigeration safeguards the fresh meats, vegetables, milk and other vitamin-rich foods so essential to the nation's health.

In army kitchens, battleship galleys, and government commissaries, . . . in groceries, meat markets, and restaurants . . . Servel refrigerating equipment is on 24-hour duty.

* * *

SERVEL has been serving the military and civilian needs of America for 20 years.

In army camps, naval bases, field kitchens, military hospitals, and scores of other important posts, Servel refrigerating equipment has long since proved its sturdy dependability, its rugged durability, and its money-saving efficiency.

Every day, more and more Servel refrigerating equipment is finding its way into the defense program—in airplane plants, precision machine shops, laboratories and other strategic spots where accurate temperature control is vitally necessary.

* * *

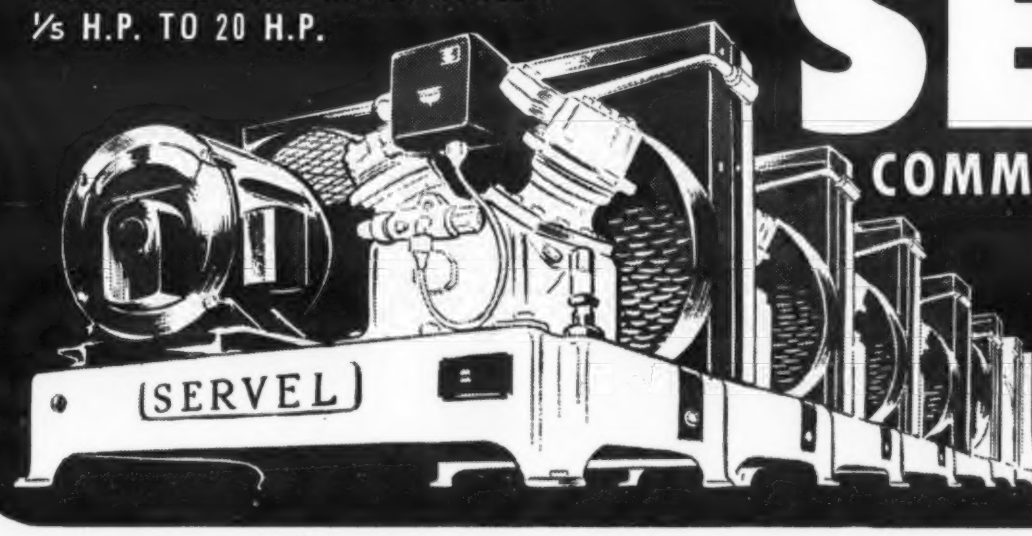
SERVEL'S large 54-acre plant has complete facilities for producing every type and size of refrigerating equipment. Its research staff, its engineers and its production personnel are ready to serve civilian needs as well as defense needs.

While a considerable portion of its productive capacity is now allocated to direct defense activities, Servel still bends every effort to supply the requirements of thousands of loyal customers.

With Servel—it's "all out for defense"—but not "all out" of the refrigerating equipment so important to national health.

For full details of Servel's ability to serve you, write today to Servel, Inc., Electric Refrigeration & Air Conditioning Division, Evansville, Indiana.

OVER 80 STANDARD MODELS—
AIR-COOLED AND WATER-COOLED
⅕ H.P. TO 20 H.P.



SERVEL
COMMERCIAL REFRIGERATION
and
AIR CONDITIONING

Back To Fundamentals!

These are some reasons, gleaned mostly from the official bulletins of agencies of the Federal Government, as to why mechanical refrigeration is vitally necessary in the home, on the farm, and in the commercial preservation of foodstuffs.

MEAT KEEPING IN HOME REFRIGERATORS STUDIED IN VARYING CONDITIONS

SOURCE: United States Department of Agriculture. By: A. M. Pabst, Junior Bacteriologist, Bureau of Home Economics.

"Bacterial activity is responsible for the advancement of spoilage of meat. The housewife can only by choice safeguard the contamination of meat before it reaches her. She does have a responsibility, however, in choosing meat of good quality and in handling the meat after it reaches her (1) to prevent contamination, and (2) to provide storage conditions which will retard the development of bacteria present.

"Temperature plays the most important part in controlling the development of micro-organisms in food. To determine the temperatures desirable for home refrigeration of meat, a study was made of the effect of different temperatures on the increase of bacteria in meat.

"The temperatures used were 35°, 40°, 45°, 50°, and 55° F. for periods of one to four days.

"The meat selected for this work was a good grade of the top round of beef — uncooked — cut in solid cubes. It was stored in covered and uncovered containers, since preliminary studies had shown that spoilage proceeded more rapidly in tightly covered dishes. In making the tests, samples were taken from 10 different places on the cube and the results given represent the averages from 24 series.

"The comparative rate of growth taking place at each temperature is shown in table below.

* * *

EFFECT OF STORAGE TEMPERATURE UPON THE NUMBER OF BACTERIA IN MEAT

Meat Stored in Uncovered Containers

Temperature °F.	Original Sample	Rate of Increase In 24 hours	48 hours	72 hours	96 hours
35	2	1	2	4	4
40	2	3	3	5	11
45	2	5	20	143	1,301
50	2	12	92	2,929	9,145
55	2	21	3,356	22,261	97,294

"It is of particular interest to note the quickened rate of growth taking place in the uncovered container at 50° as compared with that at 45°. The meat in the covered containers shows a more advanced state of spoilage than meat in the uncovered containers—signified in large meature by a greater acceleration in bacterial growth—as may be observed in the table.

The Temperatures Required

"A study of Table 11 indicates that the home refrigerator, if the meat is to be kept for more than 24 hours, should provide a temperature of below 50° F. and wherever possible a temperature of 45° or below. If the meat is to be kept longer than two days, a temperature of 45° or below ought to be provided. These temperatures coincide with those which are recommended for the safeguarding of milk."

* * *

MILK FOR THE FAMILY

SOURCE: U. S. Department of Agriculture, Farmers' Bulletin No. 1705.

Nutritive Value

"Milk contributes more to good nutrition than does any other single food.

Cooling and Pasteurization

"Low temperatures, 50° F. or below, check the growth of bacteria. In modern dairy practice, milk and cream are chilled as soon as possible after milking.

Rules For Consumers

"1. Provide a cold, clean place in which to store milk. A refrigerator that holds a fairly constant temperature not higher than 45° F. in the milk compartment is ideal. Under such conditions milk and cream may be kept 24 hours or more. If kept at 50° or above for as long as 24 hours, milk and cream are very likely to be suitable only for cooking. A low temperature is especially important in keeping milk for infant feeding or milk for the family to drink.

"2. Put milk and other dairy products into the refrigerator or cold storage place as soon as possible after they are delivered. Milk standing on a sunny porch for several hours in summer may increase in temperature as much as 10° or even 15° or 20°. This causes a tremendous increase in the number of bacteria which no amount of chilling afterward will reduce.

"3. Keep milk in the refrigerator as continuously as possible until it is used. Form the habit of putting milk, cream, and butter away first when clearing up after a meal.

"It is the responsibility of the consumer to know what clean milk is, to demand it in every community, and to keep milk in a cold, clean place from the time it is delivered until it is used.

"A good refrigerator that holds a low, constant temperature in the milk compartment is a safeguard to health."

* * *

COLD WEATHER IS NO MATCH FOR YOUR ELECTRIC REFRIGERATOR

SOURCE: Rural Electrification Administration. United States Department of Agriculture, Washington, D. C.

"No matter how cold your winters, there is no substitute for electric refrigeration.

"Modern science has designed the electric refrigerator for year around use. Nature never guarantees the regular, safe temperatures needed day-in and day-out for proper food care. Your electric refrigerator does guarantee constant, controlled temperatures, all weather, all seasons.

"Let your electric refrigerator save for you summer, fall, winter, spring. It cuts down waste from food-spoilage, keeps left-overs usable. Regardless of weather, its even temperature saves food and health, provides year around meals that tempt family appetites. It proves that a penny saved is a penny earned.

"You can't detect microbes with your naked eye. But you know very well how fast fresh food spoils in any weather without chilling. And sometimes things go bad before you know it. The result may be sickness. Electric refrigeration helps keep the doctor away.

"Your food stays fresh many times longer. You can keep milk sweet and butter firm. Vegetables stay crisp and tender, meats remain savory. With an ordinary electric refrigerator you can use your garden to the fullest advantage. Choice cuts of fresh-killed meat remain fresh. Whether it's a watermelon on July 4, or a turkey at Christmas, an electric refrigerator means fresher food.

"An electric refrigerator puts new variety in your menu all year around. Ice creams, frozen salads, delicious refrigerator cakes and cookies are easy and quick to make. There is new zest in your meals. Farm housewives may now work miracles in the way of tasty tables.

"Healthy appetites deserve healthy food, flavored at its natural best. Winter and summer, the whole family gets the benefits of an electric refrigerator—and most important, it keeps them on the road to good health the whole year through.

"You'll find an electric refrigerator a faithful servant. You'll discover more and more that an electric refrigerator is not a luxury but a real necessity all the year around!"

DEATHS FROM FOOD POISONING IN THE REGISTRATION STATES OF CONTINENTAL UNITED STATES: 1920-1939

SOURCE: Department of Commerce, Bureau of the Census, Washington, D. C.

Year	Number	Rate per 100,000 Estimated Population
1939	548	0.4
1938	608	0.5
1937	665	0.5
1936	673	0.5
1935	709	0.6
1934	738	0.6
1933	689	0.5
1932	618	0.5
1931	747	0.6
1930	782	0.7
1929	813	0.7
1928	822	0.7
1927	748	0.7
1926	778	0.7
1925	853	0.8
1924	870	0.9
1923	897	0.9
1922	789	0.9
1921	887	1.0
1920	908	1.1

Note—Rates for 1930 to 1939 are based on preliminary estimates of population.

FOOD POISONING AND POISONOUS ADULTERATIONS

SOURCE: Division of Bacteriology, Food and Drug Administration, Washington, D. C. March 1, 1940.

"Food poisoning may be divided into two classes; food infections and food intoxications. The former are caused by eating foods contaminated with living intestinal disease-producing bacteria and the latter are caused by contamination of food with chemical poisons or by the poisonous products of bacteria formed in food.

"The most common of the food intoxications is that caused by the staphylococci which are found in boils, pimples, skin infections, infected wounds, in the soil and in normal throats. Under the microscope these germs look like infinitely small marbles grouped together in grape-like clusters.

"If the temperature is right (about body temperature) this organism, as it grows, produces a powerful toxin which, although not fatal, causes a rather violent gastroenteritis. Because this germ is found practically everywhere, food may become contaminated with it in the

(Continued on Page 15, Column 1)

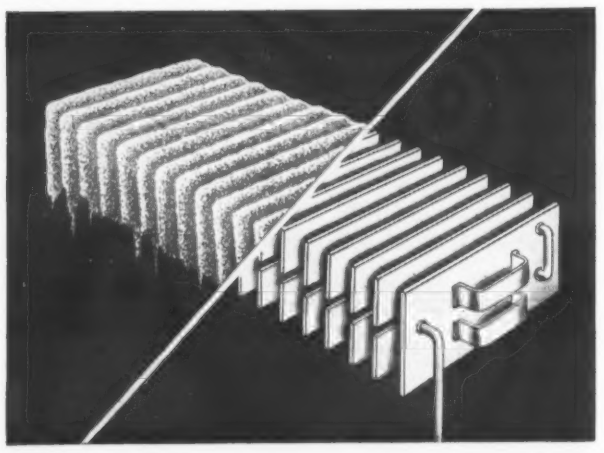
COLD ANTICIPATION

THE SENSATIONAL NEW ACHIEVEMENT IN **AVRGAIRE** CONTROLS

is Typical of PENN LEADERSHIP

● To hold temperature constantly at a selected level, and humidity at the point which prevents both excessive drying and "sliming" alike, have long been the twin goals in commercial refrigeration.

Penn's newest contribution to the Industry — the **AVRGAIRE** Control — establishes a new standard of accuracy in both temperature and humidity control, is a significant new development by engineers who have



pioneered many of the most valuable advances in commercial refrigeration.

Under the most exacting conditions of service **AVRGAIRE** Controls hold temperature within 1 degree of the selected level. By maintaining a closer relationship between coil temperature and air temperature they control humidity with an accuracy which prevents both "sliming" and "freezer burning." And to this new accuracy of control **AVRGAIRE** adds the efficiency and convenience of *selective* defrost — automatic defrosting of coils when load is normal, no defrosting when box is filled with warm produce.

Cold Anticipation is the principle which makes this new accuracy of control possible. Penn engineers have endowed **AVRGAIRE** Controls with a "magic brain" that "senses" a temperature change *before* it takes place. As a result the compressor is started or stopped at precisely the right time to avoid "ups and downs" of air temperature in the box.

All of this is provided in a control that is itself a marvel of simplicity, easy to install and adjust—and at a remarkably moderate price.

Back of this outstanding development are long years of experience in control of temperatures for refrigeration, air conditioning, and automatic heating, as well. Penn engineers have pioneered other important advances in commercial refrigeration, among which is the Penn patented magnet contact structure. This contact structure assures strong, vibration-proof snap action which makes Penn Controls the first choice on moving equipment such as refrigerated railroad cars, trucks, naval and maritime vessels.

Penn Controls thus make an important contribution to the vital service rendered by the commercial refrigeration industry in assuring a wholesome, health-building supply of food for both the military and civilian population in our country's "all-out" defense program.

***Note to Manufacturers, Distributors, aud Service Men:* Because we realize the importance of commercial refrigeration in maintaining the health and morale of our people in the present national emergency, we are doing everything we can to maintain the best possible service on deliveries, consistent with the full cooperation we are giving, both in engineering and production, to direct defense work. Your inquiries about Penn Controls are invited.**

Penn Electric Switch Co., Goshen, Indiana

PENN AUTOMATIC CONTROLS

Commercial Refrigeration—

A First Line of Defense!

A fact so obvious that its full significance has apparently escaped the attention of the directors of the national defense effort is that ultimate success is entirely dependent upon food. Success will come only to the nation that can make the greatest effort over the longest period of time. With an adequate reservoir of human energy supplied by vast quantities of food preserved by MODERN commercial refrigeration at its peak of health-giving quality, our nation will be able to sustain and to accelerate its war effort.

The Wilson Cabinet Company considers itself fortunate in being engaged in the manufacture of equipment for conserving the nation's resources of vital food, and will continue to supply modern milk coolers, reach-in coolers, walk-in coolers, and other forms of commercial refrigeration equipment in quantity for both civilian and government use AS LONG AS THE GOVERNMENT PERMITS.

WILSON CABINET CO., Smyrna, Delaware

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(Continued from Page 14, Column 5)

handling and preparation in the kitchen unless the housewife uses proper sanitary precautions. The actual contamination of the food need not be necessarily serious since the presence of this germ itself will not make the food poisonous.

"But following the initial contamination of the food unless proper refrigeration is used the organisms will grow and produce their toxin. It is this toxin which makes the food poisonous.

"Food poisoning can be prevented if reasonable care is taken in the selection of food, strict cleanliness in preparing it, thorough cooking, adequate refrigeration, and careful personnel supervision."

* * *

EXCERPTS FROM MILK ORDINANCE AND CODE

Recommended by the United States Public Health Service

SOURCE: Public Health Bulletin No. 220 (1939 Edition), Federal Security Agency, U. S. Public Health Service, Washington, D. C.

P. 75—Section 7; Item 23r. Cooling.

"Milk must be cooled immediately after completion of milking to 50° F. or less, and maintained at that average temperature, as defined in section 1 (S) until delivery.

"Public health reason. Milk produced under cleanly conditions usually contains from 1,000 to 10,000 bacteria per cc. immediately after milking. These multiply to enormous numbers in a few hours if the milk is not cooled. When the milk is quickly cooled to 50° F. or less, however, there is but a very slow increase in numbers of bacteria. In order to understand this it is merely necessary to recall that bacteria are very small plants, and that most plants do not grow in cold weather.

"Usually the bacteria in milk are harmless, and if this were always true there would be no reason to cool milk except to delay souring. There is, however, no way for the dairyman or health officer to make absolutely sure that no disease bacteria have entered the milk (even though observance of the other items of this ordinance will much reduce this likelihood), and frequent epidemics among milk consumers prove without question that this happens.

"The likelihood of contracting disease is much increased when milk contains large numbers of disease bacteria, and for this reason it is extremely important that milk be quickly cooled so that any small numbers of disease bacteria which may have entered shall not be permitted to multiply.

"Satisfactory compliance. This item shall be deemed to have been satisfied when—

"(1) Milk delivered raw to the consumer is cooled immediately after completion of milking to 50° F. or less, and maintained at or below that average temperature, as defined in section 1 (S), until delivery to the final consumer.

"In areas where electric power is available, electric refrigeration may be advantageous.

P. 128—Section 7: Item 17p. Cooling.

"All milk and milk products received for pasteurization shall immediately be cooled in approved equipment to 50° F. or less and maintained at that temperature until pasteurized, unless they are to be pasteurized within 2 hours after receipt; and all pasteurized milk and milk products shall be immediately cooled in approved equipment to an average temperature of 50° F. or less, as defined in section 1 (S), and maintained thereat until delivery.

"Public health reason. If milk is not cooled within a reasonable time after it is received at the pasteurization plant its bacterial content will be materially increased.

"The same public health reason applies to the cooling of the milk and milk products after pasteurization.

"Satisfactory compliance. This item should be deemed to have been satisfied if—

"(1) All milk and milk products intended for pasteurization, but not to be pasteurized within 2 hours after receipt at the plant or cooling station, are cooled immediately on receipt to 50° F. or below, and maintained thereat until pasteurized.

"(2) All pasteurized milk and milk products are cooled immediately after pasteurization to 50° F. or below and maintained at that average temperature, as defined in section 1 (S), until delivery.

Section 10, p. 142.

"It shall be unlawful for any hotel, soda fountain, restaurant, grocery, or similar establishment to sell or serve milk or milk products which have not been maintained, while in its possession, at a temperature of 50° or less."

* * *

REFRIGERATION ESPECIALLY IMPORTANT FOR MEAT AND DAIRY PRODUCTS

SOURCE: The Market Basket by Bureau of Home Economics, U. S. Department of Agriculture. Release for publication May 26, 1937.

"With food prices inching upward from month to month, it becomes increasingly important that none of the food we buy should go to waste because of spoilage. And there's no single piece of home equipment quite so helpful in food preservation as the refrigerator. Especially in the good old summertime.

"The coldest spot of that refrigerator should be dedicated to dairy products and meat. Both ought to have a temperature of 45° F. or below especially if they are to be kept more than 24 hours.

"With chopped or ground meats, like hamburger and fresh sausage, good refrigeration is doubly important. Such meats are usually made from small pieces, and as such have had greater chances of contamination in the meat market. And the very act of grinding a meat means increased possibility of contamination. Grinding releases meat juices. It distributes whatever bacteria may be present. It gives bacteria a larger surface to grow upon. Hence, such meats should be cooked soon."

* * *

MENUS IN THE CITY—Chap. III

SOURCE: "The American and His Food" by Richard Osborn Cummings.

"The household refrigerator not only contributed to the health of Americans by protecting foods from bacterial action; it also made use of perishables more economical. After its adoption remainders of meals and surpluses could be kept in their original state.

"Before its use meats had often been purchased in a salted condition or salted and spiced by housewives in order to preserve them. Now fresh meat could be served throughout the year.

"The economies which the refrigerator effected in use of perishables made possible larger expenditures for other foods.

* * *

CONCLUSION—Chap. XV

"While Americans in the early nineteenth century knew no set principles of balanced diet, they appear, without conscious design, to have maintained food habits which cannot be definitely termed unhealthful. They were handicapped in their choice of foods, however, by factors such as climate, and these factors might have had a particularly adverse effect on urban people who did not grow their own food.

"But, as cities increased in size, as wealth accumulated, and as technological improvements such as refrigeration and fast transportation were made, supplies of milk, fruits, and leafy vegetables became more plentiful, and many city dwellers came to enjoy a more varied diet than country folk. As farm families felt the pull of the city markets, they too raised greater varieties of food for home use, so that all groups may be said to have made progress toward attainment of adequate diet as defined by present-day standards."

* * *

REA LAUNCHES REFRIGERATOR FINANCING PLAN

SOURCE: U. S. Department of Agriculture (Release No. 310) Information for the Press—April 23, 1941.

"Agricultural experts have frequently in the past pointed out that mechanical refrigeration is essential on farms, where in most cases there is no other satisfactory method of preserving foodstuffs for home consumption or for the market."

(Concluded on Page 16, Column 1)

We know that refrigeration is essential to our modern way of life and that sales of material for this purpose are also necessary to our domestic business. We also realize that sales are just as essential to our customers. Being thoroughly conscious of these facts, we are redoubling our efforts to do everything within our power to meet delivery requirements of our customers—particularly of material necessary for repairs or replacement of existing installations.

We all know, of course, that defense materials must come first—but there will also be some materials available for domestic consumption after defense requirements have been met. Our pledge is this:

To the extent that mandatory priorities will permit, we will supply as much material as we can, and as promptly as is humanly possible under existing conditions. We will give preference to shipments being used for repair or replacement of existing installations.

We still value as our greatest asset, the cordial relations and goodwill of our many customers, and even though we cannot serve them as promptly as we both would like, we will continue to do our best and to remember that their interests are also ours.

Our policy in these troublesome times is simply this:

First—To make every possible effort we can towards the defense of our country and its institutions.

Second—To make every effort to maintain for our customers business as near "usual" as possible.

MUELLER BRASS CO.
PORT HURON, MICHIGAN

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(Concluded from Page 15, Column 5)

LOCKERS AND NUTRITION

SOURCE: Released by FCA to Southern Agriculturist, June, 1941.

"Frozen food lockers can aid defense, not only through these improvements in the diet and health of rural families, but by relieving the strain on transportation, marketing, and processing facilities during periods of emergency."

* * *

GETTING THE MOST FROM YOUR REFRIGERATOR

SOURCE: U. S. Department of Agriculture, Released for Publication July 20, 1938—Information for the Press 45-39.

"First of all, cold retards the growth of destructive organisms. That is the answer to the question, 'Why refrigerate?' Bacteriologists, including some in the Bureau of Home Economics of the United States Department of Agriculture, after testing many highly perishable products, believe that temperatures of 40° to 50° F. give adequate protection for most foods.

"Certain foods—milk cream, and raw meats—are especially inviting to bacteria, and lower temperatures are required to check their unwanted growth. The thermometer should not creep up over the 45°-mark in the section of the refrigerator where these foods are stored. Just a little more warmth than this—5° more—will increase the bacteria birthrate in a bottle of milk by hundreds of thousands in a single day.

"Epidemics of food poisoning, reported every summer, are usually directly traceable to improper refrigeration of foods of this group. Bacteria—infected custard mixtures of milk and egg, and raw and cooked meats, especially ground meats, are most often the sources of the trouble.

"Cold helps preserve the food value, flavor, and texture of vegetables and fruits. Fruits and vegetables, unlike many other foods, are still living things when stored in the refrigerator. They continue to breathe and wilt and grow old rapidly, unless these life processes are stopped by heat, or slowed down by cold."

* * *

MANAGING THE REFRIGERATOR

SOURCE: U. S. Department of Agriculture, Released for Publication July 17, 1940—Information for the Press—48-41.

"Homemakers of a few generations back were fortunate if they could keep food cool in the cellar or in a spring house some distance from the kitchen. Homemakers today take for granted the refrigerator in the kitchen. They rely on the cold air circulating in the refrigerator cabinet to check the growth of invisible bacteria and molds that quickly cause spoilage in perishable foods at room temperature.

"A temperature under 50° F. will keep most perishable foods a reasonable length of time. But a refrigerator should have some spot that is 45° F., or lower, to keep dairy products and uncooked meats.

"To keep milk cold and sweet is one of the refrigerator's most important jobs. Ordinances in most cities insure the consumer of a pure milk supply, kept safe through proper refrigeration. But from the minute milk is delivered it is the homemaker's responsibility to keep it as cold as possible."

* * *

CARE OF FOOD IN SUMMER

SOURCE: U. S. Department of Agriculture, Released for Publication Aug. 6, 1941. Information for the Press—202-42.

"Torrid summer temperatures bring special kitchen problems. Biggest problem of all is how to keep the family food supply in good condition in spite of the heat and humidity.

"Rules for keeping foods in summer are little different than at any other time of year. But the penalty for failing to observe those rules is more immediate. The penalty may be a loss of food value, a loss of money from spoiled foods, or in some instances, a bad case of food poisoning.

"Milk, cream, and raw meat head the list of foods most likely to spoil at any time of the year. They need to be kept at a temperature at least as low as 45° F. Take special precautions with raw meat, because this may spoil enough to make it dangerous to eat and still have no 'off' odor or taste.

"Cooked egg dishes—These are worthy of special attention in any season. And many a case of summer food poisonings can be traced to them. Cream puffs, potato and other salads made with egg dressing, sandwiches from eggs, devilled eggs, and custard all spoil quickly. Make them the day you want them. Keep them in the refrigerator up to the time you eat them."

* * *

NUTRITION AND CONSUMER PROTECTION IN DEFENSE

SOURCE: Office for Emergency Management, OPACS, PM 439.

"But every increase in food prices places a burden on the low-income consumer. The food price increases occurring at the present time constitute a burden which must be lightened by redoubled efforts to make possible wise buying, assist consumers to know and use the less expensive foods, and to promote special programs which put food of high nutritive value within reach of low income families.

"Increased food prices make particularly significant Dr. Wilder's suggestions for insuring proper nutrition by enriching the staple, low-cost foods. They make imperative the much wider use of quality standards and grades to enable consumers to compare products, stretch their food pennies, and make their food purchases fit their needs."

* * *

Excerpt from HOUSEHOLD REFRIGERATOR POINTS TO LOOK FOR IN SELECTING

SOURCE: United States Department of Agriculture, Bureau of Home Economics, Washington, D. C. No. 835. (4-4-40.)

" . . . There should be some place in the refrigerator where the temperature is 45° or lower for foods that spoil rapidly. The temperature at no point should go above 50° F."

* * *

PRESERVATION OF FOOD SUPPLY IS KEY TO BRITAIN'S EXISTENCE

Government Sponsors Building of Gas-Proof Low-Temperature Food Storage Plants

SOURCE: Air Conditioning & Refrigeration News, June 18, 1941.

"Pittsburgh, June 15—'Great Britain's defense, up to now, has been possible largely because it preserved and retained foods,' A. E. Stevens, vice president of Birds Eye Frosted Foods Sales Corp., today reported to the second annual convention of the Institute of Food Technologists.

"One of the ways in which quick-frozen foods may become a factor in the present emergency is through the fact that these foods require less transportation facilities and less storage space than the so-called fresh foods.

" 'This is important,' asserted the Birds Eye executive, 'as storage space near terminals diminishes daily and transportation priorities become likely.

" 'One carload of quick-frozen peas is equal to 10 carloads of fresh peas in the pods.

" '. . . I wish to stress that one carload of quick-frozen peas frees about nine other railroad cars, an important consideration when and if transportation priorities are enforced.' "

* * *

EXCERPTS FROM CONSUMER PRICES

Our Fight Against the Increasing Cost of Living
By Harriet Elliott
Associate Administrator
Office of Price Administration & Civilian Supply

SOURCE: Consumer Prices, Consumer Division, Office of Price Administration & Civilian Supply, July 17, 1941. No. 14.

Page 2: "This is a war in which food is as vital as tanks or airplanes. Secretary of Agriculture Claude Wickard has said again and again, 'Food will win the war and write the peace.' "

Page 5: "As prices rise, it becomes more and more necessary that housewives plan and buy with skill and discrimination."

Page 5: "It is your job to make your dollar get the most in terms of health, nutrition, and well being."

Your Refrigerator and National Defense

Page 6: ". . . The Department of Commerce estimates that there are probably about 18,000,000 refrigerators running today.

Page 6: ". . . It is possible for consumers to help build National Defense by using their refrigerators efficiently, by cutting down their use of power without depriving their families of adequate refrigeration."

Page 10: "Keep your box at the proper temperature. The milk compartment, right next to the ice tray unit—should be kept from 40° to 45°. . . . If it is above 45° you aren't getting proper refrigeration."

* * *

MILK AND DAIRY PRODUCTS, MOST NUTRITIVE OF FOODS, MUST HAVE REFRIGERATION

SOURCE: Air Conditioning & Refrigeration News, July 16, 1941.

"Principal advantages of mechanical refrigeration as compared with the use of ice have been outlined by Prof. Kenneth M. Renner, head of the department of dairy manufactures at Texas Technological College, as follows:

"1. Automatic in its action

"2. Insurance of a more constant temperature

"3. Less danger of contaminating the milk

"4. Actually cheaper to operate in most instances over a period of years.

". . . W. D. Teideman, chief of the New York State Bureau of Milk Sanitation says: 'Prompt cooling of milk and storing at a temperature of 50° F. or lower are very important factors in the production of high quality milk. Tests have shown that air cooling of milk in winter is unreliable, and experience has shown that it is unsatisfactory.'

Quick Cooling Important

". . . Bacteria, like vegetation, grow rapidly in warm temperatures and slowly in cold temperatures. Under favorable temperatures bacteria double in number every 20 minutes.

". . . Because of poor refrigeration facilities and consequent slow rate of cooling, it is estimated that $40,000,000 worth of milk is lost each year in the United States.

* * *

HOW PROPER TEMPERATURES RETARD BACTERIA GROWTH

Milk Temperature	Beginning	End of 6 Hrs.	End of 12 Hrs.	End of 24 Hrs.	End of 48 Hrs.
68° F.	10	17	242	61,280	3,574,990
50° F.	10	12	15	41	62

HERE'S WHAT YOU'LL SAY WHEN YOU TRY White-Rodgers CONTROLS

Indianapolis, Indiana

White-Rodgers Electric Company
1211 Cass Avenue
St. Louis, Missouri

Gentlemen:

We take a very real pleasure in sending you this unsolicited testimonial with reference to the quality of your controls.

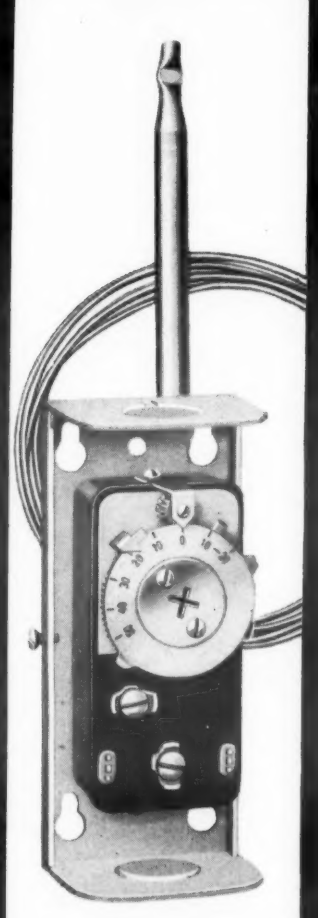
For your information we have tested and tried practically every refrigeration control on the market and our engineering department reports that after exhaustive tests and trials the White-Rodgers Control comes most nearly to meeting the strict requirements and specifications of our products and installations.

We find that your control is most accurate and also has a closer differential. We also find that it is easy to adjust and set due largely to the visible dial reading.

We have standardized on White-Rodgers Controls on all installations and our experience as indicated above indicates that your control most certainly does meet the strict requirements of commercial refrigerator usage.

Yours very truly,
R. J. Blank*

*The name of the author of this unsolicited testimonial will be furnished on request.



TYPE 1609
Hydraulic-Action Temperature Control for various commercial applications. Range −20° to +50° Fahrenheit. Adjustable differential 3° to 25°.

WHITE-RODGERS ELECTRIC CO.
1211i CASS AVENUE, ST. LOUIS, MO.
Controls for Heating • Refrigeration • Air-Conditioning

HYDRAULIC ACTION CONTROL

Use SOLIDS·LIQUIDS·GASES·SOLIDS·LIQUIDS·GASES·SOLIDS·LIQUIDS·GASES·SOLIDS·LIQUIDS·GASES·SOLIDS·LIQUIDS·GASES·SOLIDS DRIERITE for Drying
Air
Refrigerants
Industrial Gases

The Most Efficient Drying Agent

is the one which leaves the smallest amount of moisture in the system.

The Engineer does not require a drying agent to remove large amounts of water;—he can pump most of it out. It's the last traces that are hardest to remove.

DRIERITE is the **Most Efficient Drying Agent** in general use in the Refrigeration Industry.

W. A. HAMMOND DRIERITE CO., Yellow Springs, Ohio

Men In Field Pledge Aid To Any Plan For Getting a Voice In Washington

'Further Restrictions Must Be Combatted To Save Business'

SEES CAPITAL AFFAIRS NOW BADLY MUDDLED

Richmond Electric Co.
Distributors
Richmond, Ind.
Sept. 8, 1941

Editor:

I exceedingly regret that it will be impossible for me to attend your meeting of the 10th.

No time in the history of this republic that the affairs have been so badly handled as they are by this administration. It is apparent to everyone that they are just staggering around as if they were blindfolded in handling the momentous problems that confront our nation.

All that the President would have to do would be to select a real executive and give him full power to act in the matter of defense needs and also civil needs and I feel that they would be handled in a most satisfactory manner.

Of course, you know as everyone else does that the President feels that all matters should pass over his desk and it is not going to improve so long as it is handled in this manner.

If it is possible for you to give me any information after the meeting I would appreciate hearing from you.

C. A. KLEINKNECHT

CAN SAVE INDUSTRY WITH NO HANDICAP TO DEFENSE

Hopkins Equipment Co., Inc.
Exclusive wholesale Distributors
Atlanta, Ga.
Sept. 9, 1941

Editor:

I have been out of the city for several days and just returned this morning, too late for me to even think of attempting to attend the very interesting meeting you are having in your office Wednesday, Sept. 10, at 1:30 p.m.

I can tell from the tone of your invitation this is likely to be a rather interesting meeting and one which is for the benefit of the refrigeration and air conditioning industry as well as the public at large.

I am a constant reader of the articles published by yourself and having met you on various occasions at the Norge conventions, I naturally look forward to your articles and I can see that it is entirely possible to combat further restrictions and handicaps and at the same time in no manner place any restrictions upon the defense program.

If perchance there should be any minutes of your meeting, I certainly would be most grateful if you would be kind enough to have copy sent to me.

W. D. V. HOPKINS

McGREGOR PLEDGES AID TO CONSTRUCTIVE PLAN

McGregor's, Inc.
Memphis, Tenn.
Sept. 8, 1941

Editor:

Owing to a previous engagement, it will be impractical to attend your meeting of Sept. 10.

The message contained in your announcement serves as a good indication that you have some constructive plans to offer, the result of which will serve to the material advantage of distributors and dealers engaged in the refrigeration and air conditioning business, and I want to openly express my appreciation for the constructive work you are doing.

I hope you will find it convenient to write me a personal letter, outlining briefly some of your plans, and if there is anything I can do to assist in aiding the cause of the industry, do not hesitate to command my services.

JOHN M. MCGREGOR

COOPER PRAISES DRIVE FOR COOPERATIVE EFFORT

Richard Cooper, Jr.
Chicago, Ill.
Sept. 9, 1941

Editor:

I regret exceedingly that I shall be unable to be with you tomorrow, inasmuch as I have been indisposed with a strep throat for the last week.

The tone of your announcement is typical of your cooperative spirit and ideas as regards our industry. I know that you will do all possible to be helpful.

You know that our organization is highly appreciative of your cooperation and I would be interested in knowing the results of your meeting.

DICK COOPER

WARREN WORKS FOR BLANKET PRIORITY

The Warren Co., Inc.
Atlanta, Ga.
Sept. 8, 1941

Editor:

I have read the announcement of the meeting to be held Wednesday, Sept. 10, at your offices in Detroit.

I am very sorry indeed that it will be impossible for me to attend this meeting as I have been out of town so much recently that I must stay here for a few days.

I sincerely hope that some good will come of this meeting and I shall await with much interest having a report on the results obtained.

We are supplying the information that Committee No. 4 has requested in order to help our industry secure a blanket priority rating. I sincerely hope that this will be possible and I am sure that each member of the industry is grateful to you and your publication for the good you are doing.

J. D. HARRIS,
Secretary & Treasurer

SNOWDEN SAYS LOCKER PLANTS ARE STYMIED

Postal Telegraph
Memphis, Tenn.
Sept. 9, 1941

Editor:

Mr. John McGregor, president, McGregor's, Inc. suggested I wire you prior to your meeting as Vice President of the National Frozen Food Locker Association I urge that in any action you may presently take in Washington that full consideration be given in accordance with priority matters to the fundamental and vital economic features of the frozen food locker industry. This industry completely stymied by lack of priorities. Thousands of farm families and low income city families are crying for locker service for reasons of health and economy and this appeal coupled with your appeal may help in the over-all picture. Sorry cannot attend in person.

R. B. SNOWDEN, JR.

PLEDGE OF SUPPORT FROM MINNEAPOLIS

Vincent Brass & Copper Co., Inc.
Minneapolis, Minn.
Sept. 9, 1941

Editor:

I had planned to attend the meeting but press of business is going to keep me from it. Whatever plan of action you decide upon, I will be very pleased to cooperate in every way possible.

R. L. VINCENT

BUENSOD FINDS DEALERS GIVEN LITTLE THOUGHT

Buensod-Stacey Air Conditioning
Incorporated
New York, N. Y.

Editor:

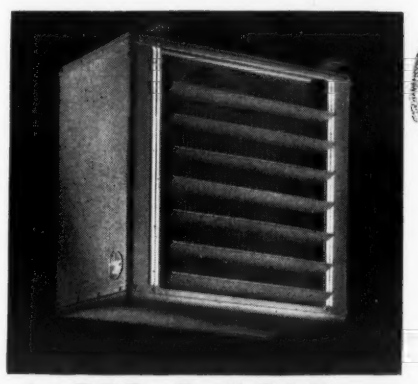
The writer is going to join you at a meeting Sept. 10 in your office in Detroit.

As usual, through your good efforts and your good paper, you are always ahead of the vital things in the industry and we want to congratulate you on being alive and up-to-date.

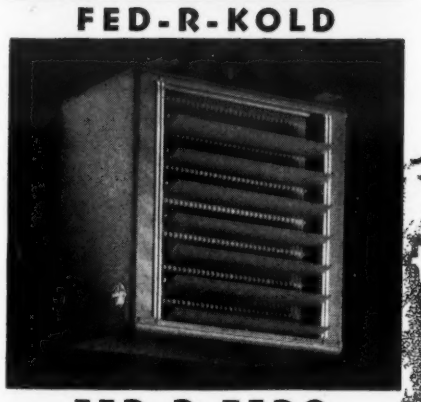
As a Heating, Ventilating, and Air Conditioning contractor, it appears to the writer that we have had very little representation, if any, and very little to say about what the priorities and emergency defense program are going to do to our industry and it is certainly time for the entire industry including the manufacturer, contractor, and all other people interested to be unified and have a voice in the future of our industry.

A. C. BUENSOD

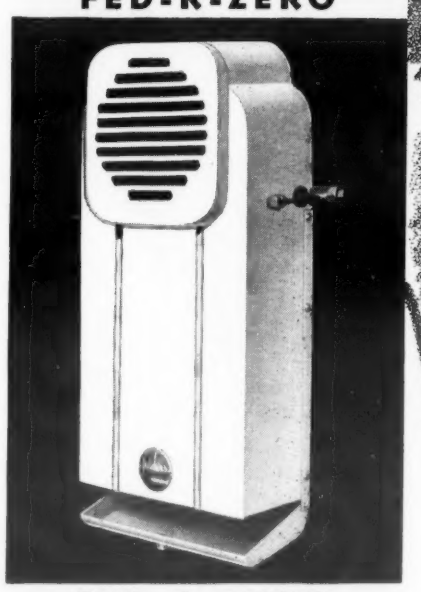
(Concluded on Page 19, Column 1)



FED-R-KOLD



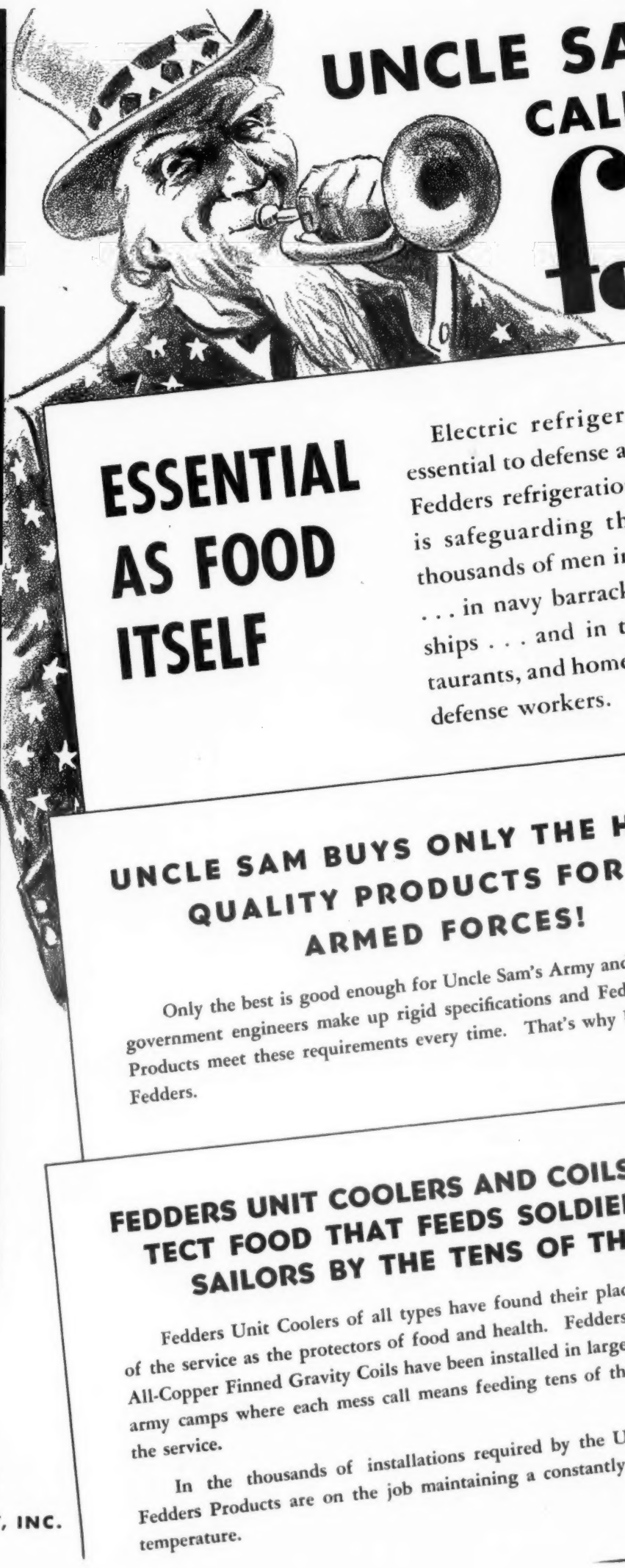
FED-R-ZERO



FED-R-LUXE

FED-R-CEILING

fedders
MANUFACTURING COMPANY, INC.
BUFFALO, NEW YORK



UNCLE SAM CALLS ON fedders

ESSENTIAL AS FOOD ITSELF

Electric refrigeration is as essential to defense as food itself. Fedders refrigeration equipment is safeguarding the health of thousands of men in army camps . . . in navy barracks . . . aboard ships . . . and in the stores, restaurants, and homes of America's defense workers.

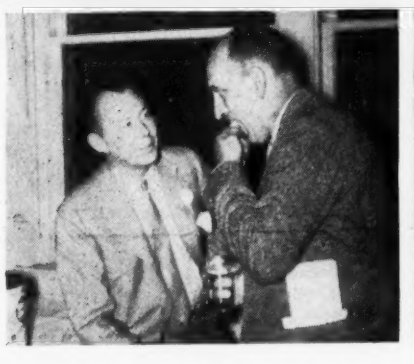
UNCLE SAM BUYS ONLY THE HIGHEST QUALITY PRODUCTS FOR HIS ARMED FORCES!

Only the best is good enough for Uncle Sam's Army and Navy. Impartial government engineers make up rigid specifications and Fedders Refrigeration Products meet these requirements every time. That's why Uncle Sam calls on Fedders.

FEDDERS UNIT COOLERS AND COILS PROTECT FOOD THAT FEEDS SOLDIERS AND SAILORS BY THE TENS OF THOUSANDS

Fedders Unit Coolers of all types have found their place in every branch of the service as the protectors of food and health. Fedders Unit Coolers and All-Copper Finned Gravity Coils have been installed in large walk-in coolers in army camps where each mess call means feeding tens of thousands of men in the service.

In the thousands of installations required by the U. S. Armed Forces, Fedders Products are on the job maintaining a constantly uniform protective temperature.



(Upper left) Frank R. Pond, Refrigeration Industrial Supply Co., Minneapolis, corners C. H. Benson, Imperial Brass Mfg. Co. (Upper right) From Saginaw, Mich. came Ray Fischer of J. George Fischer & Sons, Inc., and Ed Rummel of Kessel & Rummel, oldtime refrigeration dealer. (Lower left) J. W. Hatch (left), president of Bush Mfg. Co., Hartford, Conn., talks as Leon Young, Detroit supplier, does a little munching. (Right) "Well, you came through with a lot of ideas, anyway," says "Bill" Keefe of Fedders Mfg. Co., Buffalo (back to the camera) to Joe Oberc of J. M. Oberc, Inc., Detroit. At left, Irving Alter, the Harry Alter Co., Chicago.

Here's Why—

Both the Refrigerator and Its Industry Are Vital To Nation

By L. W. O'Brien, General Electric Co.

1. The need for adequate household refrigeration for the preservation of the family food has been well established from both health and economic standpoints. Good health of the nation is a defense necessity for high morale and productivity. Adequate household refrigeration is an important factor in the health of the nation. The fact that 16 million homes in this country are now using mechanical refrigerators shows that people of all income classes consider them to be a necessity.

The Metropolitan Life Insurance Co. has shown that from 1927 to 1939 deaths from food poisoning were reduced 83.3%. It is reasonable to assume that this is due in a large part to the increase in the use of domestic refrigerators from 690,000 in 1927 to about 16,000,000 at the end of 1940.

Harriet Elliott, Consumer Commissioner of the National Defense Advisory Committee, states in the September, 1940 issue of "Consumers' Guide":

> "Defense is planes and guns. It is equipping an army to man our military weapons. It is this, and more. It is building the health, the physical fitness, the social well being of all our people, and doing it the democratic way. Hungry people, undernourished people, ill people, do not make for strong defense."

The government has recognized the value of adequate refrigeration in the purchase of thousands of refrigerators for defense housing projects and in the past years for slum clearance housing projects.

2. Adequate household refrigeration conserves perishable foods, which will be of increasing importance as more of the nation's energy and resources are turned to defense.

The new refrigerators will go almost exclusively to families who have little or no refrigeration service. There are about 16 million families in the United States who do not have refrigerators, or who have old, inefficient ice boxes which do a poor job of food preservation and which are very expensive to operate.

There are more than a million newly married families each year who will particularly need good refrigeration as they have children.

This year about 800,000 owners of mechanical refrigerators will trade in their old models for new ones. About half of these purchases will be made because the old models have failed or are causing excessive service. Probably 350,000 of this number will be scrapped because they are no longer serviceable and the balance will be reconditioned and resold to the lower income group.

Therefore the new sales are not duplicating a service already available, but to a large extent, will provide an entirely new and most important service to the purchasers. The great majority of families buying new refrigerators will be those who most need the better food preservation and the economy of the modern refrigerator.

MECHANICAL REFRIGERATOR IS THE MOST ECONOMICAL METHOD OF SUPPLYING THE NECESSARY HOUSEHOLD REFRIGERATION SERVICE

1. It will be admitted that the needed household refrigeration should be provided in the most economical method possible, which therefore means with the minimum use of labor, materials, and manufacturing facilities to provide the original service and to maintain it.

2. It might be argued that the people needing new refrigerators should purchase ice boxes. We believe that if this policy were adopted, it would actually mean a much larger expenditure of labor and materials and would require more manufacturing and transportation facilities than providing mechanical refrigerators, together with the fact that the purchasers would have a much higher cost service.

Such a policy would still require the manufacture of cabinets, which are half of the mechanical unit.

It would mean the erection of new ice plants and storage facilities, with the necessary new refrigerating machinery and handling equipment.

It would mean the use of much more transportation facilities and man power for the distribution of the ice.

The possible use of river and lake ice would be even less efficient in man power and transportation requirements and would add the further problem of sanitation.

WHAT COULD BE GAINED FROM MATERIALLY REDUCING THE PRODUCTION OF MECHANICAL REFRIGERATORS?

1. The interest in the possible curtailment of refrigeration production is centered in the thought of making materials, manpower, and manufacturing facilities available for defense use.

2. The principal material required for mechanical refrigerators is sheet steel which will probably be available in sufficient quantity so as not to limit defense requirements. Materials such as insulation, porcelain enamel, paint, and plastics are available in ample quantity for all requirements.

Critical materials such as aluminum, zinc, brass, and tin can be largely replaced with substitutes and all manufacturers are going to such substitutes as rapidly as possible.

Therefore it appears that refrigeration production can be continued without important requirements of critical materials.

3. We estimate that the mechanical household refrigeration industry employs not more than 40,000 people in manufacturing. Only a small percentage of these are skilled mechanics. The larger manufacturers have on their own accord transferred many of their best refrigeration mechanics, engineers, and factory management people to defense work, turning over their smoothly running refrigeration work to less experienced people. In several major plants handling large defense orders, the refrigeration factory has served as a most valuable training ground for new employes who are fed into defense production as rapidly as they can be absorbed.

In addition to the manufacturing people, there are probably 50,000 people engaged to a major extent in the sales and distribution of refrigerators. Major curtailment of refrigerator production would seriously disrupt this group and affect the distribution of all other household appliances. Many of the dealers involved handle all lines of appliances but refrigeration is the backbone of their business and they would fail if it were radically curtailed. This sales and distribution group who with their families probably represent about 200,000 people, have no specialized skill immediately valuable to defense work.

The maintenance of a sound sales and distribution structure will be vital in the post-war economy.

4. Refrigerator manufacture is set up on a mass production basis with chiefly single purpose equipment, designed specifically for the refrigerator parts. Therefore the major part of the plant equipment would have to be replaced or completely rebuilt to manufacture anything else.

OTHER FACTORS WHICH WARRANT CONSIDERATION

1. Refrigeration in the Post-War Economy

The refrigeration industry has shown outstanding progress in its short history. Intensive development and research have been carried on in design, manufacture, and distribution. The results have been applied quickly so that in the short period since 1927 prices have been cut in half, operating cost reduced 50%, convenience and performance greatly improved, and potential life doubled.

This development is now being continued at the same aggressive pace. Present designs will be frozen to a major extent for the duration of the defense activity, which will mean that at the end of the war the accumulated development results will be availiable for a new surge ahead, which should contribute materially to keeping up the post-war economy.

If, on the other hand, the present refrigeration activity is seriously curtailed, such development work will be held up and the highly desirable post-war impetus lost.

2. Refrigeration's Contribution to the Defense Cost

The refrigeration industry contributes materially to the defense program through the 5.5% excise tax levied on all refrigerators sold and through the other taxes collected from manufacturers, distributors, and dealers. The excise tax alone will be about $12,000,000 this year.

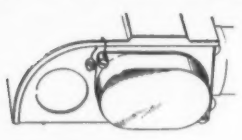
3. It is generally recognized that a nation of home owners is a strong and sound nation.

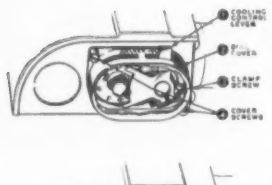
The desire for electrical appliances and the refrigerator in particular is built around the home. People will fight for the home they love.

4. Economically it is sound that people should invest in useful capital goods which provide a more economical way of living at a time like this.

5. An appreciable number of U. S. made refrigerators are exported to South American countries, thereby helping to maintain trade and friendly relations.

You Get These Extra Features at No Extra Charge



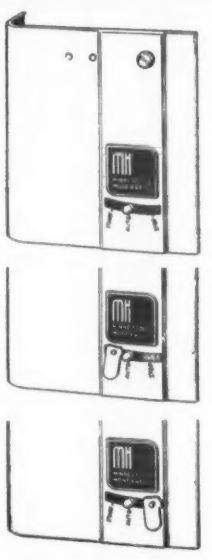


The standard tamperproof cover may be sealed in place over the adjustment knobs when necessary. (First sketch.)

You Need Only a Small Stock
TO MEET ALL TEMPERATURE OR PRESSURE CONTROL REQUIREMENTS

■ The versatility of Polartron gives it universal application. With its standard plus features and accessories, Polartron can be quickly adapted to any and all control requirements. A minimum stock of three basic models gives you hundreds of types and applications. Polartron is extremely simple and easy to install, and has only one moving lever... Look at these features: Separate "On and Off" Knobs ★ Universal Range ★ Capillary Pressure Connections ★ Fewer Models to Stock ★ Cold Control on Cut-Out or Cut-In ★ No Short Cycling ★ Minimum Free Service ★ Polartron Equipped Compressors can be Converted to Produce Frost-Free Constant Cold . . . Polartron will often save 20 to 40 percent in power and will greatly conserve food by eliminating spoilage. Minneapolis-Honeywell Regulator Company, 2807 Fourth Ave. S., Minneapolis, Minn. Branches in principal cities.

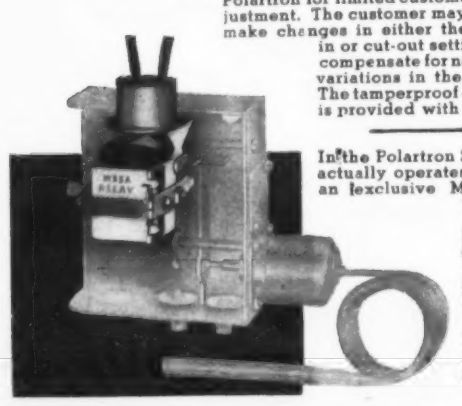
Auxiliary Covers to Provide Manual Start, Stop or Both



Supplied as standard is a COLD CONTROL LEVER that may be applied to either the cut-in or cut-out adjustment knob on the P420 or P421 Polartron for limited customer adjustment. The customer may then make changes in either the cut-in or cut-out setting to compensate for normal variations in the load. The tamperproof cover is provided with a slot on one side to accommodate the cold control lever. (See second sketch.)

For cases, coolers or walk-in boxes, the lever may be APPLIED TO THE CUT-OUT ADJUSTMENT, leaving the cut-in setting undisturbed to ensure defrosting of the coils. (See second sketch.) For freezers or beverage coolers, the lever is APPLIED TO THE CUT-IN ADJUSTMENT, leaving the cut-out setting undisturbed to prevent freezeup. (See third sketch.)

To provide manual start or stop, or both, the W66A cover may be added to any Series 40 Polartron. For example, the cover may be used for manual start on milk or beverage coolers . . . or for manual stop on systems used intermittently.



In the Polartron System the thermostat actually operates the pressure control, an exclusive M-H feature available whenever you:

1. Install a Palartron on an old or new job.
2. Modernize old jobs by installing Polartron.
3. Whenever you install a compressor which comes equipped with a Polartron.

MINNEAPOLIS-HONEYWELL
REFRIGERATION *Control*

'Direct Action' In Official Washington Is Urged By Many Industry Members

• • •

'STREAM OF LETTERS TO CONGRESSMEN'

Uniflow Mfg. Co.
Erie, Pa.
Sept. 9, 1941

Editor:

I note the meeting you are going to hold Sept. 10 for discussion of matters pertaining to the refrigeration industry, and the effect priorities are having on the industry.

You may be interested in the two letters I have just written, copies attached, one to W. A. Adams of OPM and the other to our Congressman in this district, R. L. Rodgers, who I know personally. I have written a good many letters not only to Congressman Rodgers, but to our senators from this state about these very matters. I have talked to Rodgers several times.

I have been to Washington. Several of our men have been to Washington, and we have had a stream of correspondence with OPM, OPACS, Defense Housing and FHA, but I am afraid largely, at least to the present time, it has been of no avail.

Don't get alarmed about the advantages of farm equipment and machinery manufacturers having obtained a B-1 and A-10 on parts. My letter to Rodgers will give you the story. So far actually we have not gotten it, yet we are manufacturers of farm pumps and water systems. Of course, with the confusion and the terrific job they have built for themselves they are bound to be behind in OPM. To control the whole economy of the country through priorities is some job, but if conditions are such as related by David Lawrence's publication, it appears they don't intend to give very much in the way of materials to 40 large industries.

The problem is not what the condition is today. We have felt it some or we would not have filed any PD-1's but what it is going to mean in the next few months unless conditions change.

Had I known about your meeting of the 10th sooner I would have arranged to have been there, but I have tied myself up so tight I can't make it. Mr. Martin, our vice president is out of the city in the east and it will be impossible for him to be there.

However, there is only one thing I can recommend and I don't know if it will do any good, but it is if each member of the refrigeration industry, whether manufacturer, distributor, or dealer, will keep a stream of letters going to their congressmen and senators and also to OPM and OPACS, and when possible pay visits to Washington to these departments.

It may be that they are immune to pressure now. We hear that farm machinery and equipment has obtained a priority, or at least it is available for the industry by application, and then if it is true David Lawrence's weekly paper, "The Business Executive" says it is one of the industries on the black list of 40, so take your choice.

Only if industry generally makes such a howl to their congressmen and senators will there likely be anything done, at least an investigation to see if all these strict priorities are so necessary or whether it is due to the bungled up mess.

I will be glad to hear from you, however. I suppose we will read about the meeting in your next issue.

C. A. KUEBLER,
President

'GREAT PROBLEM IN FUTURE PLANNING'

L. W. Driscoll, Inc.
Distributors
Charlotte, N. C.

Editor:

I regret very much my inability to be at this meeting of the industry on Sept. 10 in Detroit, but I should like to receive a record of what might have happened for we, like many in the industry, are confronted with a great problem in our future planning.

L. W. DRISCOLL,
President

JOBBERS ANXIOUS TO HELP PROTECT INDUSTRY

The Merkel Brothers Co.
Wholesale Distributors, Plumbers, Steam and Refrigeration Supplies
Burbank St.
Cincinnati, Ohio

Editor:

I am sure that the present officers and directorate of the NRSJA will be anxious to cooperate in any movement for the protection of our industry under the present confused and perhaps impotent thinking.

HENRY W. MERKEL

'SINGLE DIRECT APPROACH NEEDED IN CAPITAL'

Williams Oil-O-Matic Heating Corp.
Bloomington, Ill.

Editor:

Regret exceedingly that circumstances beyond my control will preclude any possibility of my attending the meeting which you have called in your offices tomorrow, Wednesday, Sept. 10, of all branches of the refrigeration and air conditioning industry.

Surely our industry owes you a very deep debt of appreciation—first, for the wonderful summary of the refrigeration industry incorporated in your issue of July 16 which surely must have pictured this business most clearly to OPM and OPACS, and also your efforts toward coordinating the efforts of all the many branches of our industry as now if ever, need a single direct approach to the various Washington agencies.

I am sure that your meeting will be a success and will look forward with keen interest to the succeeding issues of your journal for a report of the same.

M. V. STAGG,
Manager, Ice-O-Matic Division

SERVICE SOCIETY PLEDGES SUPPORT TO PROGRAM

Refrigeration Service Engineers Society
433 N. Waller Ave.
Chicago, Ill.

Editor:

I am sure that you recognize that we of the Society are most anxious to cooperate and lend our moral assistance in any move that is destined to protect the interests of the various factors in the industry.

Only too well do we realize the conditions as they confront us today and, therefore, I am pleased to advise you that I will be in attendance at your meeting.

H. T. MCDERMOTT,
Secretary

'MAINTAIN BUSINESS'

General Electric Supply Corp.
Cleveland, Ohio

Editor:

You are to be commended for the work you have done to maintain as high a percentage of this business as possible during the emergency—that is, if by so doing, no injury is done to the Defense Program.

A. F. HEAD,
District Manager

FOR GOOD OF THE INDUSTRY

Frigidaire Division
General Motors Sales Corp.
Dayton, Ohio

Editor:

I regret very much that circumstances beyond my control make it impossible for me to attend this meeting.

However, I want to wish you the best of luck in your undertaking for I am sure that any program you sponsor will be for the good of the industry.

P. M. BRATTEN,
General Sales Manager,
Appliance Division

COMMENDABLE EFFORT

Airo Supply Co.
Chicago, Ill.

Editor:

Your effort to coordinate the various branches of the industry to combat present day conditions is certainly commendable and I hope will bring encouraging results.

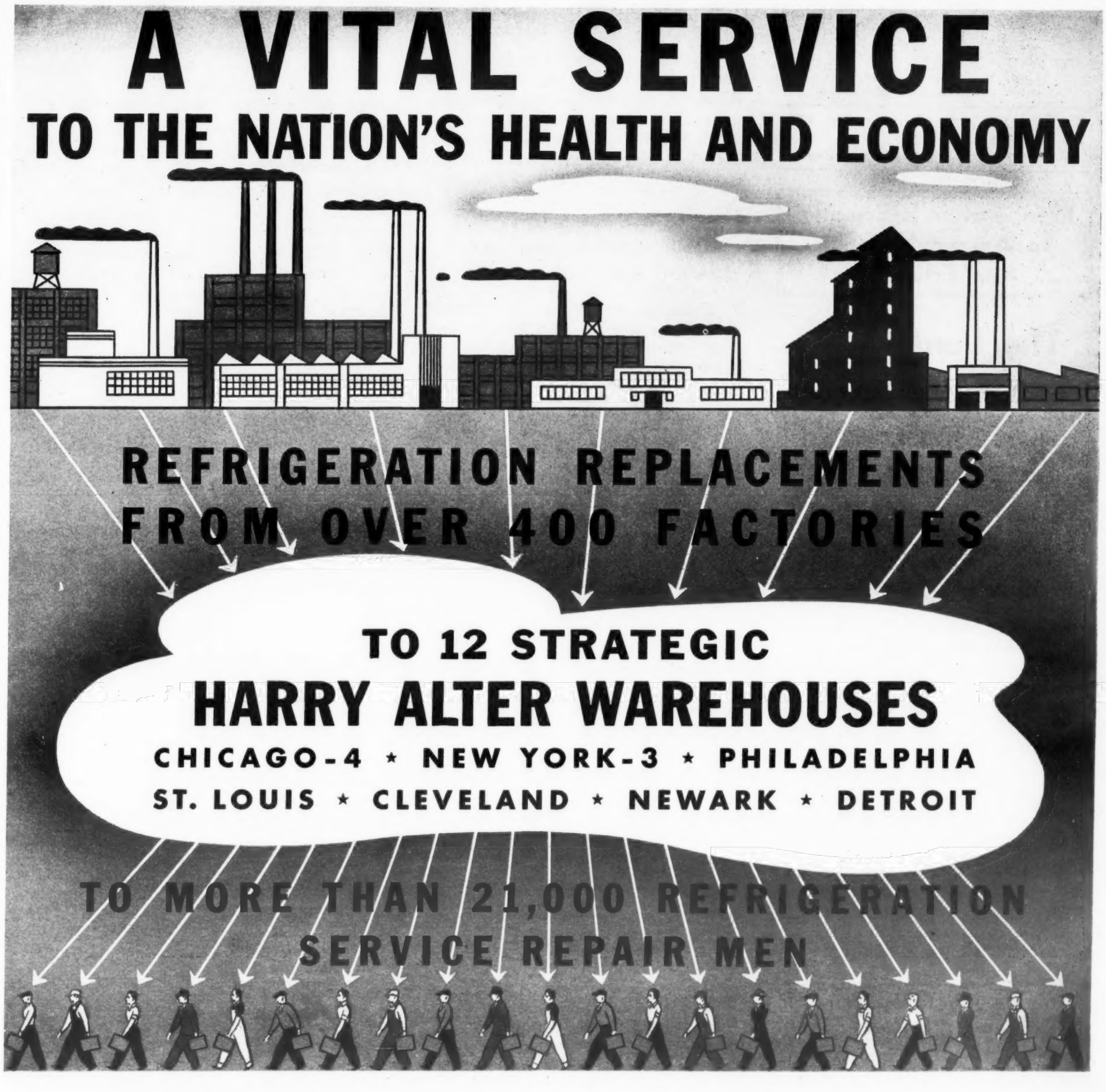
E. P. SORENSEN

INTERESTED IN DETAILS

Cleveland, Ohio

Sorry I cannot be with you but trust your industry meeting will be an outstanding success. I will be very much interested in a detailed account of what transpires.

PAUL B. ZIMMERMAN, Airtemp, Inc.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F. M. COCKRELL, *Founder*

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Refrigeration Is Essential To America's Health And Efficiency

The Lord Helps Those Who Help Themselves

SPONTANEOUS as was the response of the refrigeration industry's distributing firms to the NEWS call for a meeting in Detroit, and gratifying as was their agreement on steps that need to be taken, it must not be considered that organization of the industry's thousands of wholesalers and retailers into a "pressure group" is a *fait accompli.*

All that has been accomplished so far can be summed up as: a clear definition of purpose, a collection of suggestions for achieving that purpose, and a group of high-calibre volunteers.

These volunteers, to be known henceforth as the Temporary Educational Committee of Refrigeration Distributors, now need to be joined by hundreds of their fellow wholesalers and thousands of their related dealers in the campaign to see that refrigeration gets the "essential" rating it deserves.

HOW THE COMMITTEE GOT ITS NAME—AND WHY

Name of this committee probably needs a bit of explanation. Let's examine it, word-for-word:

(1) "Temporary" is prefixed to the name because the committee has no other function than that of starting a ball rolling. It has no intention of duplicating valuable work done by such associations as the National Refrigeration Supply Jobbers Association, the National Electrical Wholesalers Association, or state and local groups.

(2) "Educational" is used as the one word which most fairly describes the purpose of the committee. These men have no desire to "sell" an idea. They merely want to lay the *facts* before the proper people.

(3) "Distributors" is used as the one word which is comprehensive enough to embrace all those who sell and take care of all kinds of refrigeration products. It does not need to be confined to complete unit distributors, but embraces parts jobbers, retailers, and service firms as well.

Men now comprising the TECORD are among the first to realize that unless steps are taken now to tell Congress and the Administration how important refrigeration is to the nation, it may suffer even more drastic curtailment in the months to come.

They realize that we are fighting a war. They do not wish to be obstructionists. But they also realize —perhaps better than most people, because they understand the value of their own services so well—that there are two things which rank alongside of metals and machinery in Total War. These are:

HEALTH and MORALE.

Knowing how sound is their position, these men hope the several thousand refrigeration merchandising firms in the nation will join them in making heard a collective "voice" to the effect that Refrigeration Is Essential to America's Health and Efficiency.

THEY'LL TAKE CARE OF MANUFACTURERS; BUT HOW ABOUT THE DISTRIBUTORS?

There is also, of course, a selfish purpose, as well as an altruistic purpose. These men, and thousands like them, *all want to stay in business.*

Much is being said today about the impact of the rearmament program on small manufacturers. Attempts are now being made—at last—to keep them going with "defense" orders.

Nowhere, however, is anything being said *or done* about the plight of the nation's wholesalers and retailers of electrical appliances. Giving manufacturers "defense" contracts won't help the dealers and distributors.

What's to be done for them? The NEWS and TECORD propose to holler until somebody "on high" gives ear and makes provision. But our voices will be thin and piping, compared to the roar which will be heard when *all* the nation's refrigeration distributing organizations join in and swell the chorus.

The Lord helps those who help themselves.

Reactions to Limits On Instalment Sales

AMONG the dozens of letters and telegrams which flowed into the NEWS offices following announcement of the "Refrigeration Town Meeting" was the following telegram:

Western Union
Savannah, Ga.

Air Conditioning &
Refrigeration News—
5229 Cass Ave., Detroit—

In assembled Meeting Savannah appliance dealers voted to support national movement sponsored by you towards reducing drastic terms imposed upon us stop Twenty-four month maximum and ten per cent down payment desired and necessary if we are to survive stop Call on us for further support.—Savannah Appliance Dealers, Paul Kuhr, Chairman, care Southern Specialty & Fixture Co., 318 West Broughton St.

They'll Do It Every Time . . . . . By Jimmy Hatlo

LADY! PLEASE! QUICK! I ONLY HAVE ABOUT A MINUTE TO CATCH A TRAIN AND I GOTTA TALK TO MY WIFE IN HOMEBURG—AND--AND— HOW MUCH WILL IT COST?
YOUR CALL TO HOMEBURG WILL BE $4.65 FOR THE FIRST THREE MINUTES. GO AHEAD. PLEASE. BOOTH NUMBER FOUR.
LONG DISTANCE TELEPHONES
THANX TO LILLIAN STAMPKE, LOS ANGELES.
AND—AT $1.53⅓ PER MINUTE— THEY'LL DO IT EVERY TIME.
HELLO—HELLO—HONEY! I'VE ONLY GOT A FEW SECONDS TO TALK AND THIS IS VERY IMPORTANT. JUST LISTEN AND WRITE DOWN WHAT I TELL YOU TO DO. FIRST, I WANT YOU TO——
JUST A MINUTE, DEAR, 'TILL I FIND A PENCIL!
LONG DISTANCE TELEPHONES
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Although discussion of the new curbs on instalment selling did not occur during the "town meeting," considerable reaction to the new terms has been reported to the editors.

In many cases, particularly in the larger cities, the reaction has been quite favorable. Dealers have agreed that putting a low ceiling on instalment terms has eliminated one of the toughest forms of competition—that provided by certain utilities and by some "big" dealers (particularly furniture stores) which sold on no down payment and up to five years to pay.

The less liberal terms now made mandatory permit almost every dealer to sit in on the game.

Considerable criticism has been expressed, however, over the requirement that a "trade-in" refrigerator cannot be used as a down payment. Such procedure is allowed in the case of automobile selling. Why not refrigerators? Is that not an unfair and unjustified distinction?

Some dealers are already "getting around" this distinction by "buying" used refrigerators which are offered in trade. Such subterfuge should not be made necessary.

As for the longer terms called for by the Savannah appliance dealers, they would undoubtedly be helpful in many localities. That's the difficulty with regimentation from centralized "planners"—they can't possibly work out plans which are equitable to all localities.

Congress is supposed to represent all localities. And Congress should not abdicate. even in this perpetual "emergency."

LETTERS

BROTHER, THAT'S JUST WHAT WE'RE DOING

Pittsburgh Case Sales Co.
1321-29 Penn Ave.
Pittsburgh, Pa.

Editor:

We will appreciate your attention to the very important matter of seeing that electric refrigerator products are placed on Essential Priority rating.

Electric refrigeration warrants priority rating because:

1. It helps maintain the health of the citizenry.

2. It helps to supply extra amounts of vitamin content due to proper preservation in foodstuffs.

3. It helps to conserve the nation's food supply.

4. It permits of a proper routing and allocation of rail and shipping facilities, which would be in vast confusion without it.

5. It helps to keep workers in defense efforts at top efficiency.

6. It is necessary for constant replacement of existing installations which are constantly wearing out and which parts cannot suffice to repair.

7. It is helpful in reducing heavy power loads and electric current usage. Frequently one horsepower in modern equipment is used to replace three horsepower of old equipment, with better refrigeration resulting also. This reduces coal consumption and produces a chain of benefits.

8. It serves as a balance wheel in the flow of perishable foods. Lack of demand on any food at any particular moment, need not spell loss of the supply. This applies to all quantities from source to retailers.

9. A large number of employes are certain to be affected seriously if the refrigeration industry is curtailed.

W. R. BROWN,
General Manager

SALESMANSHIP EDITORIAL STUDIED BY KELVINATOR

Kelvinator Div.
Nash-Kelvinator Corp.
14250 Plymouth Rd.
Detroit, Mich.

Editor:

We have received a copy of your editorial, "Salesmanship When Your Plant Is Full of Orders," which was reprinted from AIR CONDITIONING & REFRIGERATION NEWS, and would appreciate your forwarding us 20 additional copies of same.

E. R. LEGG, Sales Manager,
Household Appliance Div.

—IN BUFFALO

Kelvinator Div.
Nash-Kelvinator Sales Corp.
163 Georgia St.
Buffalo, N. Y.

Editor:

Congratulations on a splendid editorial "Salesmanship When Your Plant Is Full of Orders."

For distribution to our dealers in the New York area and in northern Pennsylvania, we would like to secure 250 copies of this pamphlet.

If you have a supply, please send this amount and bill us for the cost.

REED M. POWELL,
Promotion Dept.

—AND CINCINNATI

Kelvinator Div.
Nash-Kelvinator Sales Corp.
118 E. Eighth St.
Cincinnati, Ohio

Editor:

Please send us 50 copies of the reprint you sent out recently containing an editorial about salesmanship during this period and what is likely to happen to manufacturers when the picnic is over.

This is not the exact title but I have misplaced the one which Mr. Rulo sent me from the factory.

H. C. PATTERSON,
Zone Manager

No Plant Expansion For Civilian Needs, Is SPAB Decision

WASHINGTON, D. C.—Expansion of plant facilities to meet purely civilian needs cannot be undertaken at this time, if such expansion requires the use of large quantities of scarce metals needed for defense, the Supply Priorities and Allocations Board ruled last week in denying the proposal of the Tennessee Eastman Corp., Kingsport, Tenn., to expand its plastics manufacturing plant.

The proposed new plant would have provided plastics said to be capable of replacing 8,000,000 lbs. of aluminum, 18,000,000 lbs. of chrome nickel plated steel, 6,000,000 lbs. of stainless steel, and 34,000,000 lbs. of zinc. The SPAB decision held that immediate construction of this plant was not advisable for the following reasons:

Building of the plant would have required the use of large amounts of various critical materials, including stainless steel, which is inadvisable in view of an expected early winter increase in the demand for nickel for armor plate and ordnance items.

Hundreds of similar applications are on hand, and no single one can properly be granted until it is known how much of a drain on scarce materials would be involved in granting all of them.

Post Commissary Loses 'Freon' Charge, Obtains Only 3 Lbs. In St. Louis

ST. LOUIS—When carelessness on the part of a workman resulted in the loss of a considerable amount of "Freon" in the cooling system for meat storage at Jefferson Barracks military post here, the quartermaster corps scoured nearby St. Louis, and was able to obtain only 3 lbs. of the refrigerant.

The emergency was finally met when 12 lbs. more of the refrigerant were flown to the city in an army bomber enroute from Kansas City to Newark, N. J. Seven tons of meat endangered by the shutdown of the cooling system survived 100° weather successfully by means of ice blocks hastily brought into the storage coolers by the quartermaster.

Urge 65° Temperature Condition To Conserve Supply of Fuel Oil

NEW YORK CITY—Cutting the temperature of homes, offices, and factories from 70 to 65° F. as a means of conserving fuel oil has been suggested to Grover A. Whalen by representatives of leading fuel oil companies in this area. It also was suggested that Christmas and Easter vacations be prolonged in the public schools, and that daily school hours be lengthened.

Mr. Whalen recently was named by Mayor LaGuardia to survey the New York gasoline situation and recommend a plan to deal with it.

Fuel oil men said there was no shortage of light oil, used for heating homes, but that there was a serious transportation problem in getting enough heavy or bunker oil for industrial plants, schools, and similar structures.

According to Norris R. Skaggs, president of the New York Oil Heating Association, lowering thermostats from 75 to 70° would conserve 10 to 15% of the fuel, and from 70 to 65° would save another 3%.

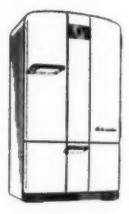
OUR CONGRATULATIONS

for Fifteen Years of Progressive Service In a Great Industry

With this issue Air Conditioning and Refrigeration News celebrates an important anniversary and Kelvinator is happy indeed to extend to this publication and its editor, its sincere congratulations.

Throughout its life Air Conditioning and Refrigeration News has consistently and forcefully urged a program of progressive action within the industry.

Best wishes for the years to come!



KELVINATOR

DIVISION OF NASH-KELVINATOR CORPORATION

DETROIT, MICHIGAN

Congress Gets Bill For Issuance of Locker Plant Certificates To Farmers

WASHINGTON, D. C.—A bill providing for the issuance to farmers of frozen food locker certificates as an extension of the Department of Agriculture's existing Food Stamp plan has been introduced into the House of Representatives by E. C. Gathings of Arkansas, and has been referred to the Committee on Agriculture.

As introduced, this bill (H.R. 5532) reads: "Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That of the funds available for carrying out the stamp plan for the removal of surplus agricultural commodities, not to exceed $1,200,000 thereof is authorized to be made available to provide for the issuance to farmers, at their request, of frozen-food locker certificates in lieu of commodity or food stamps and garden payments, in order to enable such farmers to take advantage of the marketing and nutritional benefits of frozen-food lockers."

This plan to aid national defense by improving the health of low-income families throughout rural America by enabling them to make use of the facilities offered by their local locker plant was suggested by R. B. Snowden, Jr., vice president of Frozen Food Lockers Co., Memphis, Tenn., and first vice president of the National Frozen Food Locker Association.

A previous story outlining the plan was published in the July 30 issue of the NEWS.

Fischer To Open Plant

WATERLOO, Ill. — Henry R. Fischer has announced his intention of opening a locker plant here.

'Contract Distribution' Division of OPM Aimed at Helping Small Manufacturer

WASHINGTON, D. C.—In a move to speed defense production, prevent the extinction of small business, and alleviate "priorities unemployment," President Roosevelt has created in the Office of Production Management a new division of contract distribution headed by Floyd B. Odlum, of New York.

The new division was granted broad powers to break up Army and Navy orders into smaller units, promote reforms in federal buying practices, develop programs for converting non-defense factories to arms production, stimulate pooling of productive facilities to permit small companies to share large orders, provide federal engineering assistance for non-defense business men desiring defense orders, and stimulate sub-contracting by holders of large, prime contracts.

"Priorities unemployment," some officials believe, may go as high as 2,000,000 workers in the next few months, as material shortages force drastic curtailments in the production of non-defense durable goods.

Mr. Odlum's post is on a par with the heads of other OPM divisions, production, priorities, materials, purchasing and labor, and civilian supply, with a direct Presidential mandate to make the old Defense Contract Service a more effective aid to small business. He also may take advantage of Army and Navy procurement reforms which permit negotiated contracts with a 15% price advantage for putting defense orders in factories faced with shutdowns due to priority restrictions.

His previous role in the current defense effort has been as adviser to OPA Administrator Leon Henderson. Mr. Odlum is president of Atlas Corp.

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Air Conditioning Permits 'Lightning Defense' For 'Lightning War'

Production of Vital Defense Materials Speeded Up In Air Conditioned Plants

Comfort Cooling Builds Up Morale of Army and Civilians & Improves the Public Health

Air conditioning, like refrigeration, is playing a vital role in the nation's defense effort—both directly, through installations at various military posts and in naval vessels, and indirectly by increasing the speed and efficiency of various defense industries, aiding in the maintenance and improvement of public health, keeping alive many phases of American business, and stepping up public morale through the medium of comfort cooling.

Air conditioning equipment of various types already has been installed in such army encampments as Fort Crook, near Omaha, Neb., and in a number of posts in the warm areas of the Southwest and the Pacific Coast.

ARMY ANNOUNCES PLANS

In fact only recently the War Department announced plans to spend some $500,000 for this purpose. Installations were to be begun immediately in theaters, chapels, barracks, hospitals, bachelor officers' quarters, and school buildings at these posts.

Adequate ventilation is an essential factor in the construction of present-day warships, and mechanical cooling equipment is sometimes included.

In addition to the ways in which air conditioning already has become a direct factor in defense activities, there has been much speculation as to the possible extension of its use in the future.

Word has leaked out, for instance, that Army engineers are planning the construction of huge underground barracks which are to be air conditioned. If the initial experiment is considered successful, many others may be built. Plans for the first unit have already been increased in size four times, it is said, even though construction has not yet been started.

Officials of the Meyer Memorial Hospital at Buffalo have already directed architects to prepare preliminary sketches of an air conditioned, bomb-proof shelter which may be constructed in the basement of the hospital building.

Properly ventilated garage-type loft buildings of reinforced concrete have been advocated as air raid shelters by Walter L. Fleisher, president of the American Society of Heating & Ventilating Engineers, who has conferred with British authorities on the matter.

VENTILATION BASIC

"Ventilation is the basic thing in air raid shelters," he declares. Each person housed in such a shelter, he points out, should be provided with 400 cu. ft. of air per hour.

In Canada and England, countries actually involved in the war, air conditioning also is doing its part.

Accommodations for the budding aviators stationed at new training bases being constructed throughout Canada include air conditioning (presumably of the winter type) for hangars, repair shops, offices, classrooms, dining rooms, kitchens, shower bath and lavatory rooms, and sleeping quarters.

In England, York Ice Machinery Co. actually is beginning to install air conditioning systems in underground quarters. According to Chester B. Morrison, manager of the firm's London office, so many people were forced to spend so many hours a day in air raid shelters that "the government bureaus finally began to consider the possibility of applying air conditioning to underground offices, making it possible to spend the entire day in air conditioned shelters and thereby to prevent many interruptions in the government routine.

"We are just now engaged in installing one air conditioning plant for the sole purpose of making an air raid shelter suitable for the entire office work of the organization installing it," he states.

INCREASINGLY IMPORTANT

The role of air conditioning in defense industry grows increasingly more important as the scope and nature of that industry itself increases in importance.

That air conditioning may supply at least one answer to the crying need for increased production and plant expansion is indicated by D. A. Newton of Carrier Corp.

Plant expansion takes time, men, and materials—all of which are now at a premium. So before plant expansion has been definitely agreed upon as the only means of increasing production, Mr. Newton declares, a thorough study of air conditioning in relation to the product should be undertaken.

"It might be surprising to know," he explains, "that in some instances average yearly production has been stepped up 50%, not by expansion but by producing the product under the most favorable atmospheric conditions. In addition, the quality has been improved and employe efficiency increased.

"Basically, air conditioning is purely a matter of hard and practical economics," states Mr. Newton. "It may produce comfort, but practically, air conditioning exists only because it enables us to produce more and better products at a lower cost."

In the field of basic materials, it was announced at a recent meeting of OPM, OPACS, Army and Navy officials, and iron and steel executives that air conditioning of blast furnaces in the nation's steel mills to quickly increase production of pig iron and thus help to relieve the present shortage is being planned by the government, acting in conjunction with the steel companies.

PIG IRON INCREASE

By reducing and controlling the moisture content of air blown through the blast furnaces, air conditioning has increased pig iron production of some furnaces in the Birmingham, Ala. area an average of 7% or more annually, it is reported.

Airplane production, one of the most vital of the defense industries, also is benefitting from the use of air conditioning. Outstanding proof of this fact is the 6,000-ton air conditioning system, comprising 70 separate central systems, which has been installed in the new Wright Aeronautical Corp. plant at Lockland, Ohio. This mammoth industrial unit, believed to be the world's largest aviation plant, boasts approximately 35 air conditioned acres under one roof—and this is only part of the air conditioned space.

Also slated to be air conditioned is the new Dallas, Tex. plant of North American Aviation Corp. The four systems to be installed in this plant will provide cooling equivalent to the melting of over 5 million pounds of ice every 24 hours.

This will provide uniformly comfortable working conditions for the men engaged in this precision work, regardless of outside weather conditions. It also assures accurate fitting and functioning of all precision parts in assembly, through elimination of expansion and contraction of metal due to temperature change, and also makes for freedom from dust and tarnishing of polished surfaces.

AIRPLANE PLANT

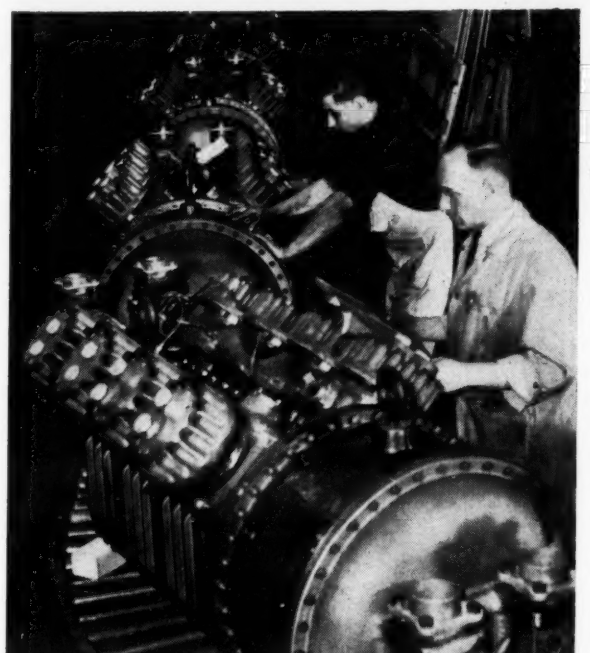
Another of the country's large aviation engine manufacturing plants was originally equipped with an air conditioning system when built in 1939. The results obtained were so excellent for both men and product that when the new windowless plant extension was erected this spring, three centrifugal refrigeration systems for air conditioning were installed. The three systems will have a total capacity of 1,950 tons.

Packard Motor Car Co. has ordered two of these same systems for the air conditioning of its new plant where the Rolls Royce "Merlin" engines will be made for British and American fighter and bomber planes.

Small air conditioning systems serve a propeller test room in the new air conditioned plant of Aero Products Co. at Dayton, Ohio. The plant itself is conditioned by a 600-ton system. Purpose of these systems within a system is to maintain special temperature and humidity

(Continued on Page 23, Column 1)

Each Unit Is a Defender



These Westinghouse refrigeration compressors for air conditioning work are the type used in the U. S. shell factory in Gadsden, Ala. and the Douglas aircraft plant in Long Beach, Calif., both of which are sealed, "blackout" plants in which normal temperatures might go to 110° F. and higher. Enemy bombers would find it difficult to put the air cooling systems out of commission, since in one plant 47 compressors will be located throughout the factories, each unit cooling a small area.

See the new complete line of Mills Condensing Units minutely described and pictured in this catalog!

Mills Mighty Refrigeration

Our brand new Refrigeration Catalog is devoted to a comprehensive review of Mills Mighty Refrigeration Products. Sent to refrigeration dealers free! Contains specifications, prices, capacity ratings, computation sheets, application recommendations, sectional line drawings and general information on refrigeration.

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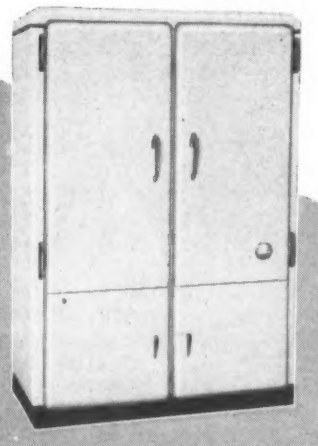
"Food Defense Is National Defense"

12 TO 71 CU. FT.



MOST COMPLETE 'REACH-IN' LINE ON THE MARKET!

Here's the widest selection of sizes and styles the industry affords—a model for every need. Distinguished by superb styling, fine construction and outstanding value.

Model 120 (above) has 12 cu. ft. capacity—the newest member of the "Midwest 'Reach-in'" family.

Model 700 (right) another new model has 71.5 cu. ft. capacity. In between is a full range of sizes and equipment. Write for full details now.

★ ★

Midwest MFG. COMPANY
Galesburg, Ill., U.S.A.

Export Division, 176 W. Adams St., Chicago
New York Office, 1775 Broadway

Wider Applications Are Found For Air Conditioning In Improvement of Health and Treatment of Disease

(Continued from Page 22, Column 5)

conditions necessary to carry on accurate tests.

Speeding up production of airplane instruments being manufactured for the government's new military planes is the function of the air conditioning system in the plant of Kollsman Instrument Co. at Elmhurst, Long Island. In the delicate operations required to turn out these precision instruments, constant temperature and humidity are of considerable importance.

Air conditioning also will be employed for cooling General Electric Co.'s new "blackout" type factory for the manufacture of airplane turbo-superchargers. Manufacture of these units involves numerous very accurate machining processes on aluminum and magnesium alloys, which require close temperature control throughout the year for successful results.

EXPLOSIVES PLANT

One of the largest special ventilating systems ever installed in a high explosives plant went into the 300 buildings comprising the Indiana Ordnance Works at Charlestown, Ind.

Several independent air conditioning systems totaling 1,200 tons of cooling capacity are said to be included in the new $15,000,000 windowless shell forging plant at Gadsden, Ala.

Among the many other industrial plants in which air conditioning is employed to speed up or to improve operations are a tool company which specializes in manufacturing high production grinding machines for turning out myriad precision parts, a manufacturer of delicate radio mechanisms, a gauge manufacturer, a plant producing a wide variety of automotive parts, and a mill turning out large quantities of brass and copper alloys.

NON-DEFENSE ACTIVITY

Typical of the wide variety of air conditioning applications in non-defense industries, are the installations in the new soap factory of Procter & Gamble, and in the studios of National Screen Co., maker of commercial movies.

In order to increase America's supply of copper urgently needed in national defense work, three new centrifugal air conditioning machines have been added to the system already existing in the Superior, Ariz. mine of Magma Copper Co.

HEALTH

Another big field in which the use of air conditioning is becoming increasingly important is the maintenance and protection of human health. Air conditioning has been the key to many forward steps in the varied fields of medicine.

For instance, air conditioning is valuable in operating and recovery rooms of hospitals because it is beneficial to operating room personnel and to patients, in preventing excessive fatigue, and drop in body temperature in the latter. Air conditioning also has reduced the bacterial content of an operating room.

USE IN NURSERIES

Another important use for controlled temperature and humidity conditions has been found to be in nurseries used for premature infants. Proper atmospheric conditions in these rooms have been known to reduce the physiologic weight loss of prematures in the first four days of life from 12.4% of the birth weight in an ordinary nursery to 6% in a conditioned nursery.

Air conditioning also is given a great deal of credit for the development of means used to create "artificial fever." This fever therapy and also the "frozen sleep" treatment, in which air conditioning equipment also is used, are branches of medicine in which much experimentation currently is being carried out.

Patients afflicted with various types of allergies also are vastly aided by air conditioning. According to Dr. Murray B. Ferderber of the University of Pittsburgh School of Medicine, "the allergic patient requires 75° F. dry bulb temperature and a relative humidity of 50% or lower in addition to an efficient air cleaner which will remove offending particles of 15 to 20 microns or smaller.

"The conditions necessary for comfort in the operating room are approximately 68° to 69° F. effective temperature, which, when given in common terms would mean a dry bulb temperature between 72° and 74° F. and a relative humidity of 50 to 60%," Dr. Ferderber states.

Graphic description of the benefit of mechanical cooling to the human body is offered by Dr. A. G. Young, director of medical research, Corey Hill Hospital, Brookline, Mass. Dr. Young says: "The human body is like a motor that is working at a disadvantage when it is subjected to excessive heat."

AID TO PATIENT

He explained further that under modern surgical practice the idea is to put the least possible strain on a patient, particularly after a major operation, and that placing the patient in an air conditioned recovery room aided materially in this respect.

The following items will give some idea of the extent to which hospitals are adopting the practice of air conditioning.

Windowless operating rooms made possible by the use of complete air conditioning were incorporated in the design of an addition to the Jewish Hospital in Cincinnati. Sanitary considerations dictated the construction of windowless rooms, which have virtually no air leakage.

Millard Fillmore hospital in Buffalo has announced plans for a four-story addition including four major operating rooms and two minor operating rooms which will be air conditioned to maintain constant temperature and relative humidity.

Nineteen rooms of the Baptist Hospital in Memphis, Tenn. have

(Concluded on Page 24, Column 3)

Air Conditioning Fights Disease

"Frozen sleep," a method of reducing the body temperature, is believed by many doctors to be a cure for cancer. It has cured dope addicts. "Human hibernation" is induced by direct mechanical cooling with the aid of air conditioning. The nurse is checking a thermometer to be sure that the room cooler is holding the temperature of the room between 55° and 60° F. while the "frozen sleep" treatment is in process.

SEEGER CONTRIBUTES
that which is essential to
AMERICAS WAY OF LIFE

ACCEPTING THE CHALLENGE *and* **RECOGNIZING ITS POSITION OF LEADERSHIP . . . SEEGER** since its inception has maintained standards of material and construction based on proven engineering principles, the direct result of which has placed Seeger Commercial Cabinets and Display Cases in an enviable position in the refrigeration field.

Adherence to these basic ideals has resulted in the development of new ideas and improvements in refrigeration to a point of perfection and economy unheard of 30 years ago, all of which has contributed much by changing in a short span of years a luxury for the few to a convenience for everyone.

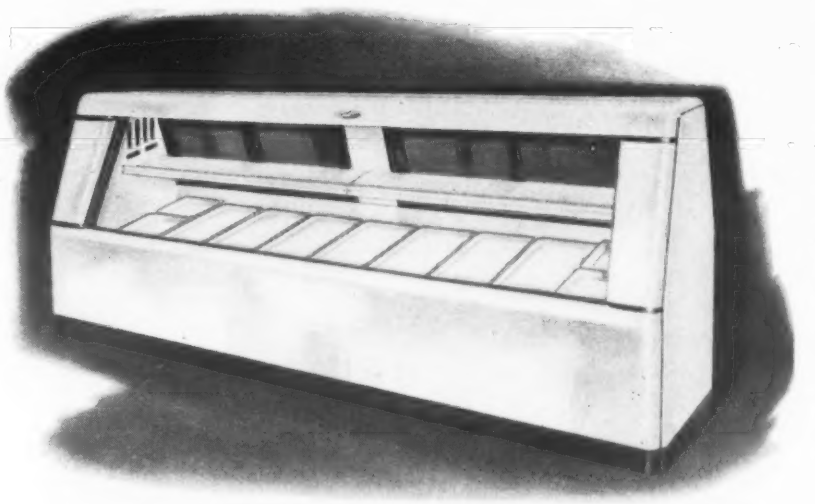
Seeger is proud to have been a contributing factor in the great refrigeration industry.

★ ★ ★ ★ ★ ★ ★ ★ ★ ★

SEEGER REFRIGERATOR COMPANY
SAINT PAUL, MINNESOTA
New York, Chicago, Boston, Los Angeles, San Francisco

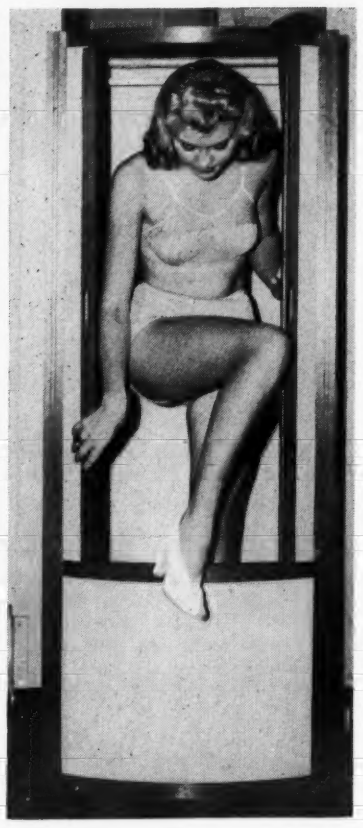
. . . series 35
is an example of

a line of six types of display cases designed for the specific requirements of the butcher, grocer, and delicatessen shop. Sizes are available in a wide range of stock models.



The Commercial Cabinet line includes twenty-four models built for air-conditioned, cross finned coils, and ice maker coils. This Complete line of cabinets from eighteen to eighty-eight cubic feet capacity will supply the needs of every type of store, hotel, restaurant, institution, or camp with time tested and approved refrigeration equipment.

'Trying on' Is a Pleasure



Comfort for customers and salespeople, and savings by the elimination of soiled dresses, are provided by air conditioning a dress shop. During hot summer days, perspiring customers sometimes spoil a dress. The perspiring girl in the photo stained the dress, but after cooling off in an air conditioned fitting room (right) slipped on dresses with no damage.

Air Conditioning Has Many Essential Uses In Protecting Health

(Concluded from Page 23, Column 5)

been air conditioned at a cost of $20,000. Because of the explosive nature of anaesthetics, 100% fresh air will be supplied to the operating rooms. All used air will be exhausted.

Four windowless operating rooms, equipped with complete control of temperature and humidity have been completed in Children's Hospital at Buffalo.

A Dallas, Tex. doctor has found that air conditioning can do much to bring to the country doctor every facility which heretofore had been considered beyond his reach.

AID IN PNEUMONIA CASES

More rapid improvement in pneumonia and influenza cases has been noted at Physicians & Surgeons Hospital at Carlsbad, N. M. since installation of air conditioning. Speedy recovery in most cases was attributed by Dr. Frank H. Austin, head physician, to the constant temperature and humidity conditions, with proper ventilation and elimination of drafts.

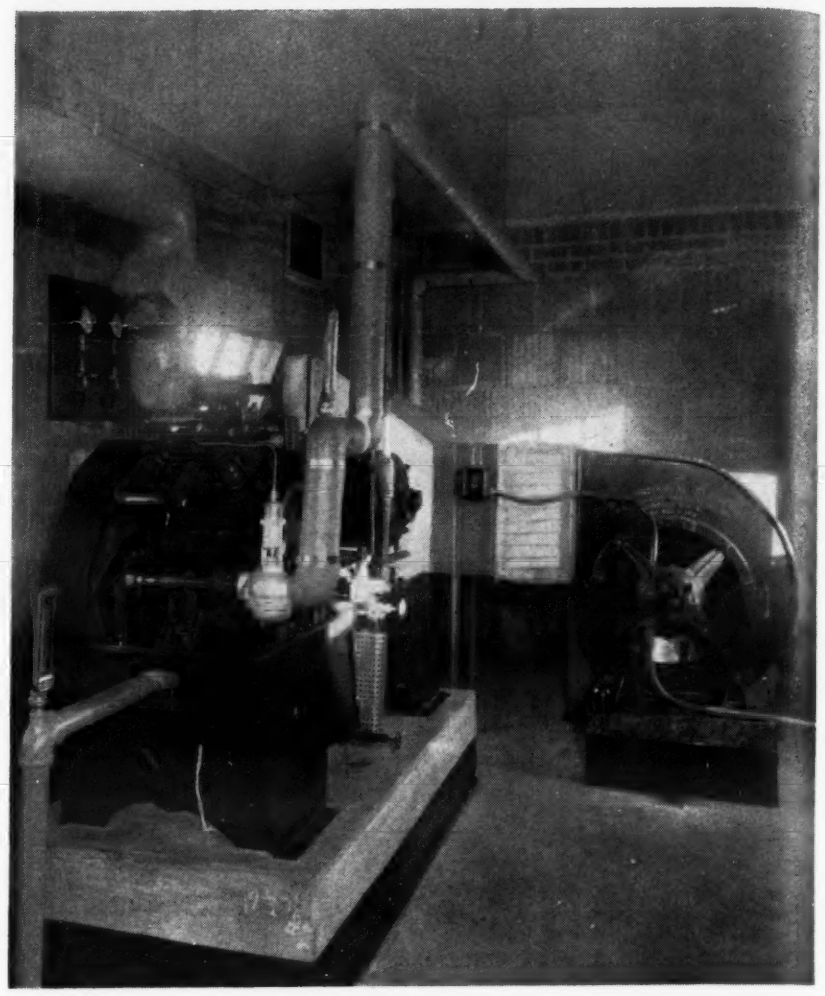
Comfort for patients undergoing deep therapy treatments is provided by a General Electric air conditioner unit in the clinic of Dr. Edwin C. Ernst in St. Louis. Absolute control of temperature and humidity is essential, Dr. Ernst has found, in the room where deep therapy is used.

FROSTBITE CARE

Two room coolers are employed in Charity Hospital, Cleveland, in the room where severe frostbite cases are treated. A comparatively low temperature in this room was needed, since any considerable variation from outside conditions would tend to produce shock in the frostbite victims, and make recovery more difficult. During summer months, the room is used for treatment of fever sufferers.

An air conditioned ambulance has been placed in service by Sparkman-Brand, Inc., Dallas, Tex., to eliminate the problem of abrupt temperature changes in moving a patient from home to hospital.

Comfort For War Veterans



Five operating rooms and a receiving hall in the U. S. Veterans Hospital at Memphis, Tenn. are equipped with year-around air conditioning powered by this model W-1500-FH Brunner compressor. The system, which is located on the sixth floor of the building, uses 100% fresh air and is controlled to maintain 75° F. with 50% relative humidity at all times.

Delivering Started on Air-Conditioned Coaches for NYC

BUFFALO — Air conditioned and equipped with electrically refrigerated drinking fountains, the first of 95 new streamlined passenger coaches have been delivered to the New York Central System and are being used on the Empire Express. Delivery of the cars has been delayed by material shorages, but current deliveries are expected to be at the rate of one daily.

Although the new coaches seat 28 fewer travelers, the cars are the same length as the old ones. The remaining room is taken up by two luxurious combination lounges and smoking rooms, about four times the size of rest rooms in the old cars.

There are seven double-size and three regular-size windows on each side of the cars as compared with the 22 single windows on older coaches. Cemented in rubber, the windows permit no dust to enter.

COMMERCIAL AND COMFORT USES

Practically limitless are the commercial and comfort applications of air conditioning. Air conditioning equipment of varying kinds is used in an infinite variety of business establishments, both for the comfort of employes and customers and for product preservation. Comfort cooling in homes and offices also is making rapid strides.

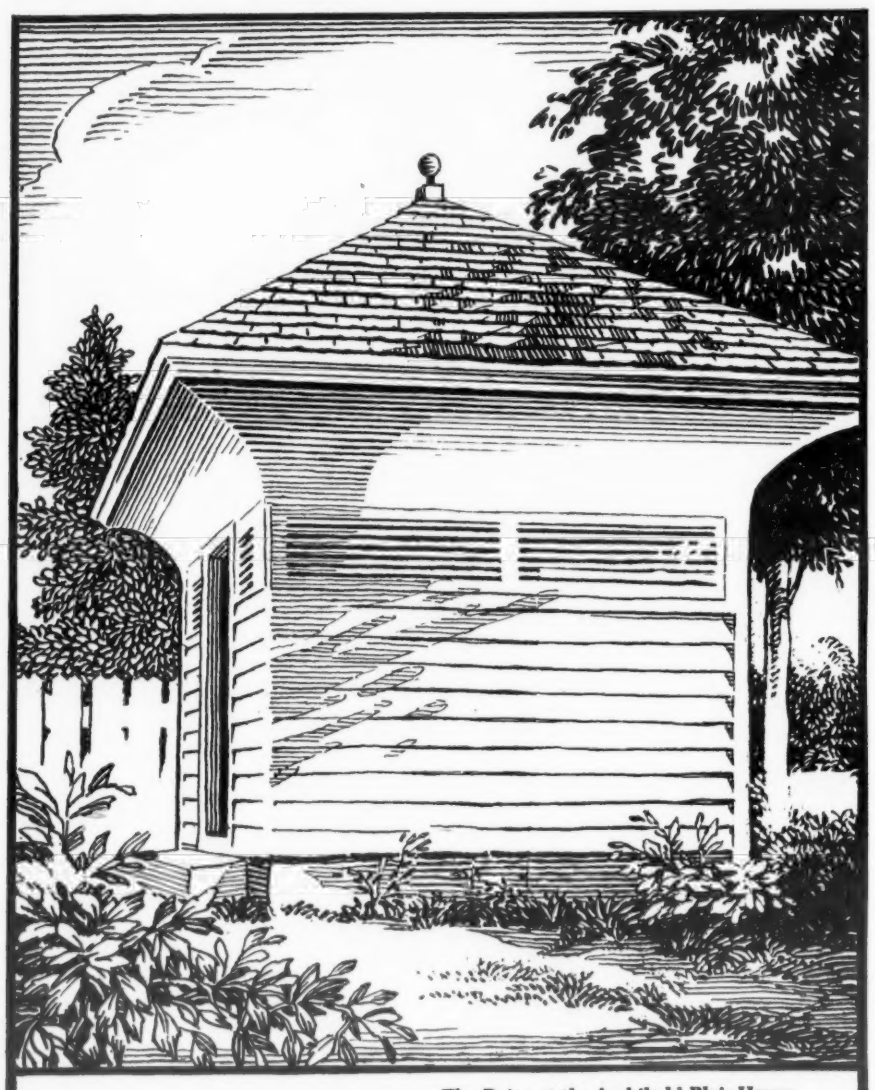
In both commercial and comfort cooling, the trend has been definitely toward the use of packaged, self-contained, unitized equipment which can be installed with a minimum of effort and removed just as simply.

COMMERCIAL USES

Here are just a few of the multitudinous uses to which air conditioning has been put: comfort cooling in business establishments ranging from dry cleaning and dyeing firms to frozen food locker storage plants; maintaining the freshness of eggs in poultry markets; simplifying fittings and demonstrations in gown and lingerie shops, and in the quarters of firms selling trusses or elastic foundation garments; comfort cooling in hotels, restaurants, night clubs, theaters, and branch sales offices, as well as the offices of doctors, dentists, lawyers, and other professional men; complete cooling of newspaper offices and printing plants; and comfort cooling on passenger trains and in government buildings.

Plan Year'Round System In New Buffalo Store

ROCHESTER, N. Y. — A year-around air conditioning system will be installed in the store building at 132-134 Main St. here recently leased by H. L. Green Co., Inc. John B. Pike & Son, Inc. is the general contractor.



The Dairy at the Archibald Blair House, Williamsburg, Virginia.

VIRGINIA—a name that has earned respect

Compare the Blair Dairy of Colonial Days, where dairy products were cooled by the evaporation of water, with any one of the spotless modern dairy plants where Virginia products today provide scientific and reliable refrigeration.

Here is a dramatic illustration of the changes brought about by the development of a great industry—refrigeration. The Virginia Smelting Company is proud to have been a constructive partner in this advance.

BUY YOUR KINETIC'S FREON-12* VIA VIRGINIA *Reg. U. S. Pat. Off.

EXTRA DRY ESOTOO · Methylene Chloride · V-METH-L

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Ask your jobber for Jarrow Products

MANUFACTURERS: Let Us Help You With Your Gasket Problems

MOST COMPLETE LINE OF REFRIGERATOR GASKETS AND SPONGE RUBBER INSULATION

Refrigeration In Defense

A Few Millionths of an Inch May Mean Victory Instead of Defeat for Allies

Air Conditioning In Tool Plant Makes Possible Precision Gauges For Arms Manufacture

HARTFORD, Conn.—A first step in Defense—the manufacture of precision gauge blocks widely used in arms manufacturing—is being accomplished with greater speed and accuracy in the new Pratt & Whitney plant here.

This company is world-famous as a maker of machine tools, measuring devices, and precision gauges. Its machines played a vital part in producing the guns and other equipment necessary for winning World War I, and it is functioning in the same manner on a large scale in the present emergency.

In 1939 the firm built a new glass-and-steel plant in West Hartford. The main building measures 1,000 by 550 feet. Some 2,300 machine tools were moved into it.

PROVIDED MORE ROOM

Anticipating a larger and larger demand for tools and gauges made to exact sizes, Pratt & Whitney provided for much more spacious constant-temperature rooms in their new plant. In these rooms are finished the precision gauge blocks (first developed by Major Hoke of the Army Ordnance Department, and named after him) which are made accurate to a few millionths of an inch.

C. L. Roberts, chief engineer of the Automatic Refrigerating Co., Frick Co. Hartford distributor, describes the air conditioning system which makes way for the claim that these rooms are the most accurately controlled working spaces of this kind in existence.

"The floor size of the first new constant-temperature room measures 240 ft. long by 40 ft. wide; two large rooms take up most of this space. One of these is used principally for manufacturing, while the other is the inspection room where the final measurements are carried out on such a precision basis. There are five rooms in all. The building is enclosed in another outside of it, to reduce wind and sun effects.

DESIGN CONDITIONS

"The conditions set up for the constant-temperature room were 68° dry bulb and 50% relative humidity, to be maintained the year around. These are the conditions which are used by the U. S. Bureau of Standards in Washington, D. C., and are accepted as those to which all most accurate measurements should be referred.

"The importance of exact control of the dry-bulb temperature is easily recognized on account of the precision apparatus in use. The constant relative humidity of 50% is necessary due to the use of the interferometer, which is dependent upon the velocity of light waves for its use, which velocity in turn is affected by a change in the relative humidity in the air.

"The very exact conditions that were demanded recommended the use of an air washer, delivering air at a practically constant dewpoint, all the year around. Any change in room conditions due to infiltration of air at either a lower or higher dewpoint is compensated for by a room humidistat varying to a slight degree the dewpoint of the delivered air at the washer.

EQUIPMENT USED

"For the supply of chilled water, which load amounted to approximately 40 tons, we furnished Frick ammonia refrigerating equipment, using a 7 by 7 compressor driven by a 40-hp., 2-speed motor, connected to a 20-in. by 15-ft. shell-and-tube water cooler. A shell-and-tube water condenser, 16 in. by 18 ft., was used.

"A high-pressure float gives a most simple ammonia control, keeping the condenser completely drained of liquid and the entire charge in the shell cooler, at the proper height for full capacity. This ammonia cycle has operated without any difficulty whatever since its installation.

"A 155-g.p.m. pump circulates the cold water, held at approximately 40°, through the shell cooler, delivering it to the spray nozzles in the air washers. The standard system of pneumatic bypass valves is used for the control of the water temperature to the spray washer, by means of the dewpoint thermostat.

"The main supply fan, driven by a 5-hp. motor, circulates a total of approximately 12,000 c.f.m. of conditioned air to the five constant-temperature rooms. Four of these rooms have a finned heating coil in the supply branch leading to each; the heating effect is regulated by a reset recording controller pneumatically operated to hold a constant temperature in the room.

"The fifth room, which is the large inspection room where the most exacting work is performed, is divided into four zones, each zone being served by an independent branch duct with a finned heating coil and a separate thermostat to control this coil and thus maintain the zone at 68°.

"These recorder controller thermostats produce a remarkably constant control of the dry-bulb temperature. Many of the charts show a variation in temperature over the 24-hour period of not over one-fourth of one degree, plus or minus.

Tools & Gauges Are Accurate Here

This is one of the several rooms in Pratt & Whitney's New Hartford plant held constantly at 68° F. and 50% relative humidity so that tools and gauges for arms manufacture can be made accurate to within a few millionths of an inch.

"About 80% of the conditioned air is recirculated to the air washer, where it is mixed with approximately 20% of fresh air. All of the air is filtered before entrance to the washer. A relief air damper is also provided in the return air system: this is automatically operated so that the amount of recirculated air may vary from zero up to 80% and correspondingly the fresh air may vary from 20% to 100%, depending entirely on the temperature of the outside air.

"Three automatic dampers in the system are all controlled together to regulate the amount of outside air admitted to the apparatus. A thermostat is placed in the fresh-air entering duct, which is affected very much like a wet-bulb thermostat would be.

"The action of this instrument is such that if at any time should there be less heat in the outside air than in the recirculated air, the dampers will then throw over, taking in 100% fresh air, passing the control of this amount over to the dewpoint thermostat, which can then reduce the amount of fresh air in case the dewpoint cannot be maintained by admission of the full amount.

"The entire control of the conditioner, therefore, is automatic, taking care of the various changes over the whole year and at a minimum of refrigeration for the maintenance of the proper dewpoint. One change per hour of fresh air is used at all times, for proper ventilation. If however, any economy in refrigeration can be effected by using more outside air, one of the thermostats accomplishes this change.

"As the outside temperature falls still further, until no refrigeration whatever is needed, the dewpoint is maintained by balancing the amount of necessary fresh air against recirculated air. This balance is in use until the winter temperature may drop so low that heat must be added to keep up the dewpoint, using the amount of fresh air necessary for ventilation, at which time a steam heater on the spray water system comes into action.

"The operation of this first constant-temperature room has been so successful that when the Pratt & Whitney Co. last fall planned a further addition to their factory for carrying on more defense work, we obtained a second contract for Frick equipment to handle another constant-temperature room, three-fourths the size of the original one, or 180 ft. long by 40 ft. wide.

"Although the reduction in size would have made it possible to use a Frick 6 by 6 compressor, it was decided to hold to the same 7 by 7 size as in the original installation due to the possibility of further expansion."

WHERE DO WE GO FROM HERE, BOYS?

Today the refrigeration industry finds a new answer to that oft-sung query: "Where do we go from here, boys?"

In this time of crisis, our duty is clear.

First, we must permit no let-down in the refrigeration service to which America has grown accustomed—the service which provides the American family with a year 'round supply of healthful, varied food. On it depends the high American standard of nutrition—the standard which experts, both in and out of Government, count on to build and bolster the national morale in the coming months and years.

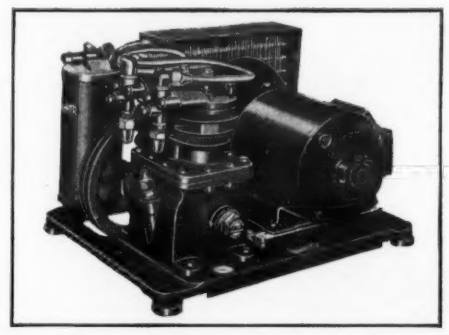
Second, but equally important, we must do all in our power to help supply the tools and services needed for the achievement of the common goal—security in adequate Defense. The time is too short to permit any quibbling. As individuals and as an industry, we must do our Defense jobs as they are given us to do—but quickly!

We, here at Brunner, are meeting the double challenge by plant expansion, by increasing the number of employees, by working day and night, by rearranging our manufacturing methods. Our employees, too, are cooperating wholeheartedly to speed up production of refrigeration units and other tools and equipment necessary to the National Defense Program.

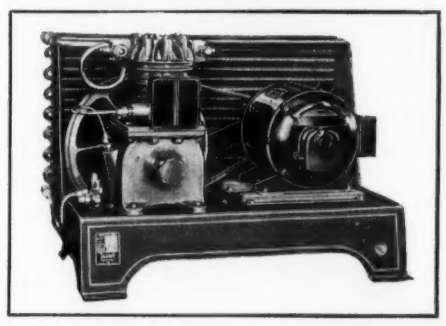
BRUNNER

MANUFACTURING COMPANY, UTICA, N. Y., U. S. A.

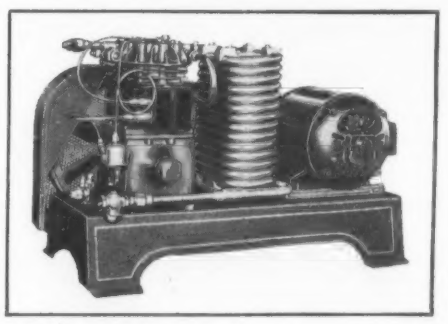
Air Compressors • Refrigerating Equipment



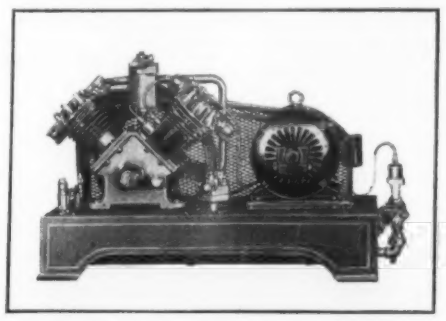
BRUNNER MODEL A-38 . . . ⅓ h. p. air-cooled close coupled condensing unit, ideal for use with cabinets and boxes where space available for unit is limited. It is also well adapted for large domestic refrigerators and self-contained cabinets within its capacity.



BRUNNER MODEL A-100 . . . 1 h. p. air-cooled condensing unit for average heavy-duty commercial applications. It will handle an 8′ x 6′ x 10′ cooler in addition to a 16′ display case. Also recommended for beer coolers for pre-cooling barrels of beer.

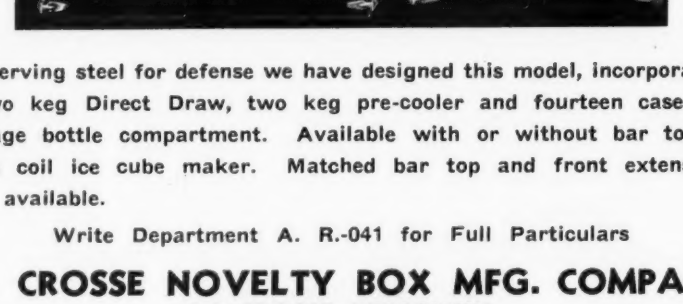


BRUNNER MODEL W-200 . . . 2 h. p. water-cooled condensing unit especially adaptable for large soda fountains and large walk-in coolers or to handle a battery of market display cases. An ideal unit for medium size air conditioning installations.



BRUNNER MODEL W-500 . . . 5 h. p., 4 cylinder water-cooled condensing unit for heavy duty commercial and air conditioning applications where high efficiency, low power consumption and quiet operation are of prime importance.

ALL THREE-IN-ONE
LA CROSSE CLUB SPECIAL



Conserving steel for defense we have designed this model, incorporating a two keg Direct Draw, two keg pre-cooler and fourteen case dry storage bottle compartment. Available with or without bar top or plate coil ice cube maker. Matched bar top and front extensions also available.

Write Department A. R.-041 for Full Particulars

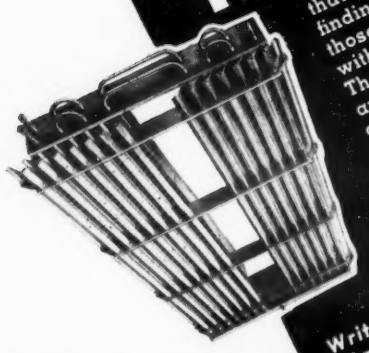
LA CROSSE NOVELTY BOX MFG. COMPANY
LA CROSSE, WISCONSIN

For dependable lowsides Buy...

RIGIDBILT

It is not an accident or a trick of fate that more and more contractors are finding that their own interests and those of their customers are best served with Rigidbilt lowsides.

The illustrated Modulator for walk-in and reach-in fixtures is an example of a perfectly designed coil for maintaining proper temperatures, air circulation and humidity. With capacity conservatively rated, with scientifically designed air circulation, it is the coil that makes tube restriction and without internal you wish that all your jobs were equipped with Rigidbilt lowsides.



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If your jobber can't supply you, write direct

PROMPT SHIPMENTS

RIGIDBILT PRODUCTS UNIT COOLERS FIN COILS . . . MODULATORS

Chieftain

A NAME TO REMEMBER

Chieftain—a name that is only six years old, yet represents one of the most outstanding achievements in the refrigeration industry. It is a name that has been placed on over a million compressor and condensing units. It is a name you will always associate with the highest quality. It is a name to remember for greater profits.

TECUMSEH PRODUCTS CO. TECUMSEH MICHIGAN

Chieftain

Commercial Refrigeration Has Spread Its Essential Service to All Food Handling

From Farm and Packing House to Store and Restaurant, It Works Quietly And Efficiently to Handle a Rapidly Increasing Flow of Perishable Goods

THE early years of refrigeration are symbolized in most of our minds by the huge steam engine in the window of the local ice house, silently driving the ponderous ammonia pumps and condensers. Somehow, it was responsible for the ice wagon's delightfully cold cargo.

Commercial and household refrigeration markets were fairly simple at that time. Insulated cabinets of slight variety were built by cabinet makers. The ice house sold the ice.

We have seen that the household market for electric refrigeration has changed considerably. The commercial market is even farther removed from the original picture.

Broadly speaking, the commercial market includes the production and distribution of dozens of different types of equipment for use by merchants, producers, and business establishments. Products in this category range from frozen foods chests to milk coolers, from soda fountains to water coolers. The production of these items, and of the condensing units which cool them, is split among hundreds of manufacturers. Their sale is made through a variety of channels, depending upon what's being sold and who is buying it.

Commercial refrigeration in the electrical, small unit field, was not generally accepted until 1925. From 1925 to 1929, it enjoyed a tremendous boom, with the result that hundreds of thousands of butcher shops, groceries, restaurants, and other food retailers were equipped with mechanically cooled display fixtures, walk-in coolers, etc.

Following the pattern of general business, sales slumped precipitously during the following five years, and it was not until 1937 that new all-time highs were recorded. Since that time, spurred by a large replacement market (more than 60% of sales) and trends toward store modernization and new building, the sales curve has again advanced sharply upward.

It should be noted that corrosion in most commercial installations makes replacement necessary after years of hard service.

PRODUCTION CLASSIFICATIONS

(1) **Condensing units,** including the refrigeration compressor, motor, and a condenser coil.

(2) **Evaporators,** conforming roughly to the freezing compartment in domestic refrigerators.

(3) **Fixtures,** such as display cases, ice cream cabinets, etc., representing the space to be cooled.

Such a division by products is by no means a clean cut division of manufacturers. Some assemblers produce finished commercial units without fabricating any of the parts. Some fabricate or build condensing units, compressors and motors, buy the coils for assembly, and sell this equipment to others, or buy fixtures and evaporators for assembly in their own plant.

(Concluded on Page 27, Column 1)

Commercial Refrigeration Sales (1940)

COMMERCIAL CONDENSING UNITS	NO. OF UNITS SOLD	$ VOLUME ($000 OMITTED)
1. LESS THAN 1-3 HP.	79,000	$ 4,319
2. 1-3 HP.	69,000	5,247
3. 1-2 HP.	40,000	4,410
4. 3-4 HP.	23,000	3,256
5. 1 HP	14,000	2,487
6. TOTAL UNITS SOLD SEPARATELY	**225,000**	**$ 19,718**
SELF-CONTAINED UNITS		
7. WATER COOLERS, COMPLETE	31,000	$ 3,941
8. ICE CREAM CAB., COMPLETE	42,000	8,825
9. BEVERAGE COOLERS, COMPLETE	61,000	7,351
10. MILK COOLERS, COMPLETE	2,000	402
11. TOTAL SELF-CONTAINED UNITS	**136,000**	**$ 20,519**
12. TOTAL OF LINES 6 AND 11	**361,000**	**$ 40,237**
CABINETS ONLY		
13. WATER COOLERS	12,000	$ 998
14. ICE CREAM CABINETS	22,000	2,288
15. BEVERAGE COOLERS	24,000	1,872
16. MILK COOLERS	8,000	416
17. TOTAL CABINETS ONLY	**66,000**	**$ 5,574**
18. DISPLAY CASES AND MARKET REFRIGERATORS*	**42,540**	**$ 27,000**
COMMERCIAL AND INDUSTRIAL CONDENSING UNITS		
19. UNITS FROM 1 1-2 TO 10 HP.	27,367	$ 11,565
20. UNITS FROM 11 HP. UP	5,682	12,786
21. OTHER EQUIPMENT		122,120
22. COMMERCIAL & INDUSTRIAL	**33,049**	**$146,471**

***Single-duty cases, 8,800; double-duty cases, 19,800; reach-in cases, 8,500; bakery cases, 640; sectional cases, 3,400; vegetable cases, 1,400.**

This Represents Part of Where and How Commercial Refrigeration Is Applied in Our Daily Life

Many Factors Involved in Manufacturing and Distributing Commercial Refrigeration

(Concluded from Page 26, Column 5)

Nearly 500,000 condensing units, ranging from ¼ hp. up, are produced and sold yearly by 38 manufacturers. Some smaller units are of the hermetically sealed type.

About 600,000 evaporators are built for the commercial market yearly by 34 manufacturers. Though these are different types, all employ fins or tubes to carry refrigerant.

About half of all these products is sold to fixture manufacturers, for assembly in "packaged" equipment. The remainder is sold through distribution channels, for assembly in equipment at the point of installation. About half the manufacturers control the bulk of the business, but it is by no means as concentrated as in the household field. As a matter of fact, the business at present is dominated by small specialist manufacturers.

DISTRIBUTION

Much of the "packaged" (complete for delivery) equipment moves through the hands of distributors and dealers as in the household field.

Some "packaged" and most "assembled on the job" equipment moves through strictly commercial dealers.

Of some 7,000 of these outlets, about 1,600 do 85% of the business. They specify much of the equipment.

Service men who are called to repair, replace, or install equipment may also buy certain parts. They will obtain these from the jobber who handles a variety of lines or from the distributor of certain lines. Sometimes a service man will recommend new equipment, and make the sale.

Jobbers sell equipment, both for new installation and for replacement, such as motors, condensers, coils, evaporators, valves, refrigerants, tools, and thousands of small parts. They may sell to service men and dealers, and to small manufacturers who assemble equipment. They also sell to large national consumers.

Just about anybody may make a sale. Manufacturers sometimes handle big orders direct, such as to a national dairy or packing house. Distributors will sell to firms of state-wide importance. The dealers and service men do the neighborhood business.

Du Pont Issues Data on Proper Painting of Cooling Coils

WILMINGTON, Del.—Adverse effects of frost, moisture condensation, and inequalities of temperature on the refrigeration coils and other metal surfaces in dairies and ice cream plants can be combatted by proper paint treatment, but this treatment is apt to be difficult, it was found in studies of painting requirements of various industries recently completed by paint technicians of E. I. du Pont de Nemours & Co., Inc.

Because dairies operate the year around and have few hours available for maintenance painting, and because milk products absorb paint odors readily, painting presents quite a problem.

The du Pont studies suggest that before painters begin the actual painting they should wipe off all surfaces with absorbent material to remove condensed moisture. Quick-drying materials should be applied, with an undercoat on walls and ceilings in the late afternoon to permit drying before the dairy resumes its normal routine. Before applying the second coat on the following day, the painters should again wipe off condensation with an absorbent material.

Two coats of red lead primer with no finishing coat generally suffice to protect refrigeration coils, the technicians found. Here again the surfaces should be wiped dry before painting.

For bare tanks and other metal surfaces an oxide primer followed by a quick-drying machinery finish is recommended. Previously painted surfaces should first get a white undercoat.

On large surfaces where high degrees of condensation are encountered the "ground cork" treatment is suggested. Following a prime coat and a metal-protective finish, ground cork should be applied over the surface. After this has set another finish coat is applied. Besides providing insulation against temperature changes, the ground cork treatment is said to reduce condensation as much as 80%.

Commercial Refrigerator Sales By Years

Estimated United States sales of commercial condensing units, up to and including 1 hp., including units sold separately and those sold in connection with low side applications such as water coolers, ice cream cabinets, beverage coolers, and milk coolers:

1923	1,700
1924	9,500
1925	37,500
1926	75,000
1927	125,000
1928	154,000
1929	178,000
1930	124,000
1931	139,000
1932	79,000
1933	81,000
1934	109,000
1935	113,000
1936	218,000
1937	286,000
1938	218,000
1939	285,000
1940	361,000
FIRST HALF 1941	290,000
TOTAL SALES FOR ALL YEARS ...	2,883,700
NUMBER NOW IN USE	2,100,000

General Urges Use of Frozen Fowl to Save Laying Flocks

ATLANTA—In an effort to avoid a threatened shortage of eggs, and to conserve laying flocks, marketing of frozen poultry is being encouraged by Brigadier General James L. Frink of the Fourth Corps Area Quartermaster department here.

Purchase of frozen chickens in July and August, the periods during which the Department of Agriculture seeks to conserve laying flocks, also served to stabilize the market, which officials estimated had 13,500,000 lbs. more of frozen storage in poultry May 1 than a year ago.

The conservation program, according to Lieut. Col. William F. Ritter, chief of the supply division of the Fourth Corps Area Quartermaster's office, fitted into original plans to serve only frozen fowl to soldiers on maneuvers in central Louisiana.

Kelvinator Votes Dividend Of 12½ Cents

DETROIT—A dividend of 12½ cents per share on outstanding capital stock, payable Sept. 26 to stock of record at the close of business on Sept. 10, has been voted by directors of Nash-Kelvinator Corp.

WHY YOU SHOULD OFFER

A REGULAR CHECK-UP SERVICE NOW

TO EVERY REFRIGERATION USER!

Every refrigeration user is a candidate for your service today. And this means not only large users of air conditioning and refrigeration equipment, but also such smaller users as grocers, butchers, florists, and even householders. Why? Because it's more important than ever not to waste refrigerants. If users want to keep their equipment in operation, they *must* conserve their refrigerants.

Your customers will appreciate a regular maintenance service. Now is the time to get them to form the habit of using it—insure a steady volume of future business for you.

Although our plant is producing as much "Freon-12" as ever, defense needs are taking a large portion of the production. But careful estimates indicate that if waste and losses are eliminated, the saving will compensate for existing shortages. That's why you should offer a regular check-up service to conserve "Freon-12" *now*—to prevent losses before they occur. It's your opportunity to increase your business and at the same time perform an invaluable service for your customers.

Study the check list below to make sure you utilize every possible means of combatting these four major causes of waste and losses:

(1) *Leaks*

(2) *Overcharging systems*

(3) *Incomplete removal of "Freon-12" from cylinders*

(4) *Purging "Freon-12" into the air*

Feature a regular check-up service *now*. For detailed instructions on the servicing problems of various fields, send for folder.

CONGRATULATIONS to the News on the Fifteenth Anniversary of its founding. We hope that it will continue, as it has in the past, to present the live news of refrigeration and air conditioning, and supply leadership in solving the problems vital to the continuation of a sound industry.

CHECK LIST
FOR CONSERVATION OF "FREON"
Do not overcharge system.
Weigh a sufficient amount of "Freon" for efficient operation.
Test system for tightness.
Use dry CO2 or nitrogen rather than "Freon."
Evacuate shipping cylinders completely.
Condense the vapor and salvage the refrigerant.
Do not purge "Freon" into the air.
Pump the "Freon" into the receiver or into a clean, dry cylinder for reuse.
Look for accumulations of oil
which have leaked from the systems. They may indicate the presence of a leak.
Use a Halide lamp or torch to locate leaks.
It gives instantaneous reaction to even minute leaks.
Check systems at these points:
Gaskets on the crankcase cylinder
Crankshaft bearing housing
Cylinder head
Stuffing box or shaft seal
Valve stems and pads
All connections (threaded, flared, welded, brazed or soldered)
Control devices
Oil separators
Compressor
Condenser
Evaporator
Auxiliary control apparatus
All castings and tubings
*"Freon" is Kinetic's registered trade-mark for its fluorine refrigerants.
KINETIC
REG. U. S. PAT. OFF.
FREON
REG. U. S. PAT. OFF.
safe refrigerants

KINETIC CHEMICALS, INC., TENTH & MARKET STREETS, WILMINGTON, DELAWARE

Lions Lick Their Chops at the Sight of Fresh Frozen Food (Horsemeat) Prepared At San Diego Zoo's Refrigeration Plant

Animals Are Healthier With Germ-Free Food and Zoo Saves Money By Buying In Quantity

SAN DIEGO, Calif.—Many of the 3,500 animals exhibited in the Zoological Gardens now eat germ-free fresh frozen foods—horse meat and fish—at considerable savings following the installation of extensive commercial refrigeration equipment which permits the zoo to freeze and store its meat, as well as store fruits and vegetables.

These freezing and storage facilities allow the zoo to buy food in quantities at the best prices and store it for later use, besides improving the quality of the food.

Six Brunner compressors, 33 vacuum plates, and five unit coolers comprise the refrigeration equipment serving the freezer and three cooled rooms. A fourth room houses the compressors.

WANTED FOR YEARS

For several years the management of the zoo had realized the need of a refrigeration plant large enough to store 60 days' supply of food, for occasionally some animals had to be fed on a substitute diet because the food needed was not on the market. In addition it was generally necessary to pay higher prices for small quantity purchases. Following a study of the zoo's requirements, it was decided to "fast freeze" horse meat for the two-month storage and to store fruits and vegetables in a cold wet atmosphere.

Horse meat and fish are frozen in a cabinet 20 feet long, 4 feet wide, and 8 feet high containing 28 22-inch by 8-foot Dole vacuum plate shelves. The cabinet is of wood and metal with 2 inches of insulation and finished in white enamel. It has 14 doors on each side. The shelves will hold and freeze 2½ tons of meat or 2 tons of fish. Their capacity is 400 pounds an hour or nearly 5 tons per 24 hours.

Three R-5000 Brunner 5-hp. compressors maintain a —27° F. temperature on the plates. The compressors are connected in series, using common suction and discharge lines. Ranco pressure controls are adjusted so that the first compressor operates on a normal cycle when the load on the freezing plates is very light. As the load increases and the back pressure builds ½ pound the second compressor cuts in. Another ½-pound increase in back pressure starts the third compressor.

EXACT CONTROLS

When the load on the freezer is heavy all three compressors operate until the product is frozen and then stop at the same cutout point of the controls. Extremely exact setting of the controls is required for this job, but it has been operating for eight months with no adjustments needed.

The freezing cabinet is located in the center of a room 25 feet square by 11 feet high, used for the storage of frozen meat and fish. Metal bar shelves provide storage space for 38 tons of meat and fish, nearly three months' supply. Five six-plate Dole vacuum plates refrigerated by another R-5000 Brunner 5-hp. unit hold temperatures in this room at —8° F. Defrosting is accomplished by merely sweeping the plates with a broom, thus avoiding shutting off the cooling system and warming up the room.

Various tests have been conducted regarding the effects of fast freezing on the many parasites that infest fish and frequently infect the animals that eat such fish. It has been learned that freezing of fish at —27° F. for 24 hours is more than enough to kill all the larval worms, and that subsequent storage at —8° F. is sufficient to prevent any further infection. Zoo animals, it is believed, will have better health and increased comfort when fed germ-free food.

SECOND STORAGE ROOM

The second refrigerated storage room is designed for the storage of fresh meat and fish to be fed within a few days and for the slow thawing of the frozen products. It is 18 by 25 by 11 feet in size. Temperature here is maintained at 34° F. by two Fedders Fed-R-Fin unit coolers connected to an R-2000 Brunner 2-hp. compressor. Relative humidity is held at 88% to maintain good color and flavor in the meat and fish for long periods.

"Sides" of meat are hung on meat track hooks to reduce handling while smaller pieces and fish are stored on trucks and dolleys for easy handling to the trucks that deliver to the animals.

FRUITS & VEGETABLES

Fruits and vegetables are stored in a third room the same size as the second under a temperature of 37° F. and 88% relative humidity. Three Fedders Fed-R-Fin unit coolers powered by another 2-hp. Brunner compressor supply cooling for this room, which has a storage capacity of 40 tons. The cooling equipment is large enough to permit quantity purchases up to 5 tons.

All the compressors, motors, condensers, receivers, controls, and electrical equipment are housed in a machinery room 16 feet by 8 feet by 9 feet high.

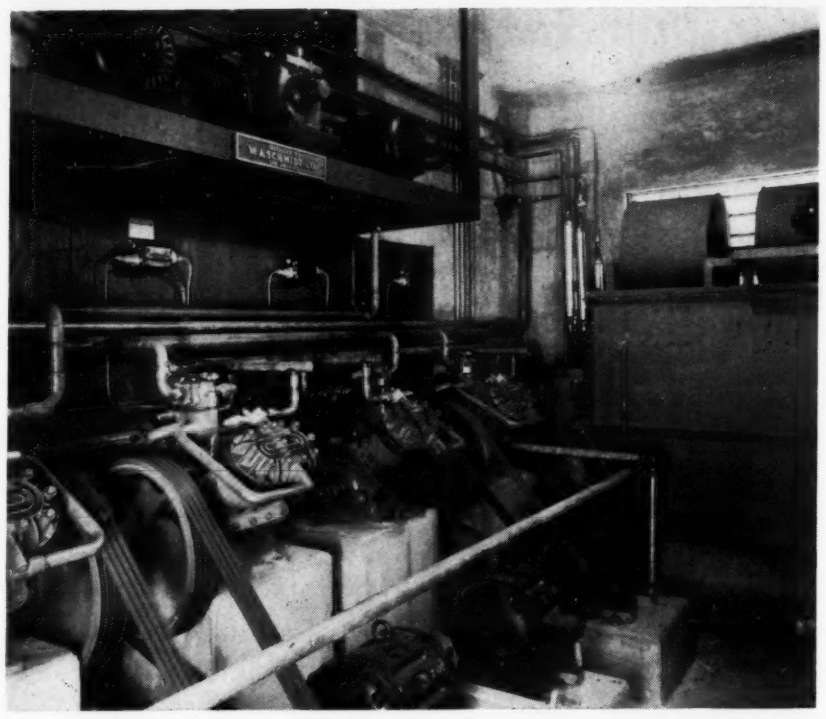
Oil separators are installed on the four 5-hp. compressors. Despite the fact that there is vertical rise in the suction line of 10 feet at the evaporator end and a run of more than 110 feet to the three compressors in the sharp-freeze system, no oil troubles have been encountered, it is reported. The compressors have a common oil return, and the level has remained the same since the plant was first placed in operation, it is said.

INDIVIDUAL REGULATION

Each of the refrigeration systems may be individually regulated to meet any change of conditions that may be encountered later. Operation of the plant is almost wholly automatic. Except for the necessary sweeping of the vacuum plates no manual defrosting is necessary. Defrosting of the unit coolers is automatic. The only periodic attention required is the monthly oiling of the motors, requiring only about an hour at a time.

The installation was made by the W. A. Schmidt Co., Los Angeles refrigeration contractor.

Machinery In San Diego Zoo



Six compressors provide refrigeration for a large freezing cabinet and three rooms used to store meat, fish, fruits, and vegetables fed to the 3,500 animals exhibited at the San Diego Zoological Gardens. Like a household unit, the zoo's system means better food and savings through quantity buying.

Grocery Remodels To Add Locker Plant

WADENA, Minn.—Gaslin's Grocery here is being completely remodeled to accommodate the new frozen food locker plant which is being added in the form of a brick addition to the rear of the store building.

New Locker Plant Opened In Lufkin, Tex.

LUFKIN, Tex.—Owned by Dr. B. E. Trigg of Dallas, the Lufkin Frozen Foods Co. plant was opened recently. Southern Refrigeration Co. built the plant, which uses Carrier equipment.

Fischer Considers Another

CLAYTON, Ill.—H. R. Fischer, Quincy, Ill. meat market and locker plant owner, is considering the possibility of constructing another locker plant here.

Bel Air, Md. Plant Opens

BEL AIR, Md.—What is believed to be the first locker plant established in this area has been opened by Corbin Ice & Fuel Co. here.

The locker plant utilizes a total load of only 10 hp., compared to the 90 hp. which the Corbin firm requires for its ice-making activities.

Frozen Foods Vital In Increasing Production

CHICAGO—The frosted foods industry expects to be a leading factor in the increased production of foodstuffs as a part of America's defense effort, A. E. Stevens, vice president of Frosted Foods Sales Co., told members of National Food Distributors Association at the frosted foods session of the organization's annual convention here.

Birds Eye Frosted Foods has increased its production 40% this year, Mr. Stevens said, and is prepared to achieve further gains in the coming year. He predicted that other companies in the frosted foods field also would seek increased production in the next years.

Predicting that the day will come when frosted foods "will become as indispensible a part of the American way of life as the automobile and the radio are today," Mr. Stevens told how, although there were only 36 stores handling Birds Eye foods 10 years ago, this number had increased to 1,200 by 1936, when other frosted foods processors entered the field. Today, he said, between 18,000 and 19,000 stores are selling quick-frozen foods.

Build 300-Locker Plant

KEWASKUM, Wis. — Sylvester Harter, proprietor of Harter's Market here, is building a 300-locker frozen food storage plant.

Lockers For Cheyenne

CHEYENNE, N. D.—Erection of a new frozen food locker plant, in connection with a meat market, is under way here.

Kiermas Building Plant

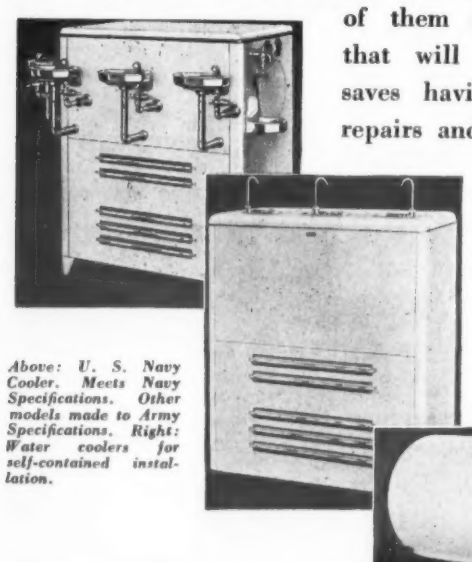
SHIOCTON, Wis.—Ray Kiermas, who operates a locker plant in Stephensville, is building a plant here that will contain 336 lockers.

Plant Opened By Dairy

BEMENT, Ill.—Benton Ice, Dairy & Locker Co., managed by Leo Heffington and Francis Anderson, has opened a complete service locker plant here.

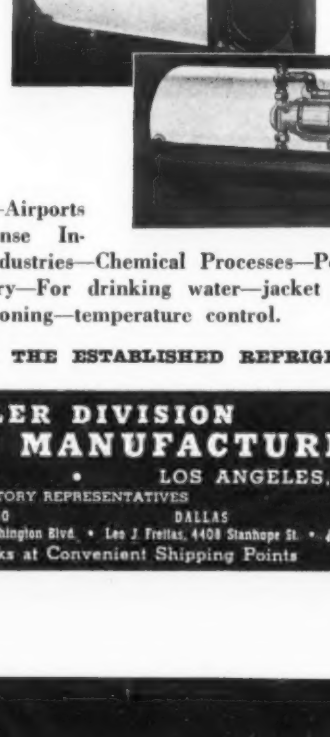
Let's All Pull Together!

THE way out of the Great American Dilemma calls for coordination. We're all in the same boat . . . and we won't get far until we all pull together! If priorities are necessary, let's make every one of them count by specifying equipment that will outlast the emergency. That saves having to get priorities later for repairs and replacements!

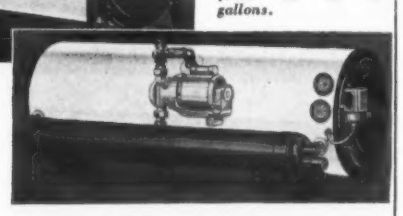


Above: U. S. Navy Cooler. Meets Navy Specifications. Other models made to Army Specifications. Right: Water coolers for self-contained installation.

For over a decade "Day & Night" Storage Type Water and Beverage Coolers have played an important part in the development of modern Refrigeration and Air Conditioning. They are known and used from coast to coast.



Left: Normal Suction Pressure Storage Tank Coolers in all sizes. Capacities from 2 to 105 gallons. Below: High Suction Pressure Storage Tank Coolers in capacities from 25 to 150 gallons.



TYPICAL APPLICATIONS OF "DAY & NIGHT" STORAGE TYPE COOLERS

Army Barracks—Naval Stations—Airports—Naval Vessels—Shipyards—Defense Industries—Food Industries—Chemical Processes—Petroleum Industry—Bottling Industry—For drinking water—jacket water—processing water—air conditioning—temperature control.

SOLD THROUGH THE ESTABLISHED REFRIGERATION TRADE

DAY AND NIGHT

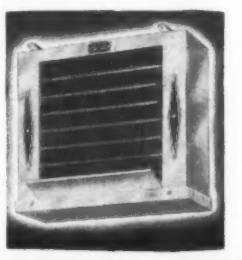
COOLER DIVISION
DAY AND NIGHT MANUFACTURING CO.
2320 EAST EIGHTH STREET • LOS ANGELES, CALIFORNIA
FACTORY REPRESENTATIVES
NEW YORK: A. C. Homeyer, 682 Broadway • CHICAGO: Marc Shantz, 565 Washington Blvd. • DALLAS: Leo J. Freitas, 4408 Stanhope St. • DECATUR, GA.: J. E. Parker, 228 Second St.
Warehouse Stocks at Convenient Shipping Points

In the Camps and at Home . . .

LARKIN is at Work on DEFENSE Of HEALTH!

LARKIN PRODUCTS INCLUDE

- Bare Tube Coils
- Zinc Fused Steel Plate Coils
- Heat Exchangers
- Instantaneous Water Coolers
- Cross Fin Coils
- Humi-Temp Forced Convection Units
- Disseminator Pans
- Evaporative Condensers



Originators Of The Cross Fin Coil

Originated by LARKIN, the CROSS FIN COIL has maintained its rank in the refrigeration industry as the GREATEST CONTRIBUTION to the construction of refrigeration coils for commercial cooling purposes.

Cross fin construction results in quicker defrosting, higher relative humidities and more even temperatures. This has meant the saving of thousands of dollars through reduced operating costs and dehydration losses.

See Your Jobber or Write Direct to
LARKIN COILS, INC.
519 Memorial Drive, S.E., Atlanta, Ga.

ESTABLISHED 1928

LARKIN
REFRIGERATION PRODUCTS

Another 'Army' At Work—

How Household Refrigerators Are Moved From Factory to Kitchen

The problem of household refrigerator distribution—of routing a refrigerator from its production at the factory into the kitchen of the average American home—has been dovetailed so smoothly that, in the eyes of most consumers, such a problem just doesn't exist.

Actually, however, the job of getting a refrigerator from factory to kitchen is a many-sided task involving the full-time efforts of an army of men and women on factory staffs, distributor and factory branch organizations, dealerships, and servicing organizations—and reaching out to cover a multitude of "allied" operations, including advertising agencies, newspapers, magazines, and radio stations, printers, engravers, real estate operators, trucking and delivery agencies—to name only the most prominent.

Before considering this complete merchandising process and the myriad steps it entails, let's take a brief glance at the household refrigerator industry's sales and servicing operations strictly in terms of employment:

100,000 Are Dependent

Best estimates are that approximately 20,000 firms are now engaged in the selling and servicing of household electric refrigerators in the United States. Figuring an average of five persons per dealership—a most conservative estimate, since many fair-size dealers have more than that number of salesmen alone—gives us a total of approximately 100,000 persons, enough to make up the population of a city like Utica, N. Y.; Duluth, Minn.; Tampa, Fla.; or Gary, Ind.; in the retail field alone.

Approximately 1,500 firms are engaged in the wholesale distribution of household refrigerators, each firm serving a number of retailers in territories covering sections of one or more states, in some instances an entire state. Estimating an average of 30 employes in each distributor's organization—including sales, sales promotion, advertising, and general office workers—brings an additional 45,000 workers into the picture.

Add to these figures the number of persons associated with the sales, sales promotion, and advertising staffs and agencies of the various manufacturers — perhaps another 1,000 workers—and you have a fair over-all picture of the number of individuals who make their living directly from the sales and servicing branches of household refrigeration.

Carrying these figures a step further and translating them into terms of family groups, it can be conservatively estimated that the livelihood of approximately a half-million persons is affected by the distribution activities of the household electric refrigeration industry.

The Chain of Dependency

But this, after all, is only a comparatively close-up view of the distribution picture. Add to it the number of workers in advertising agencies who are concerned with the production of advertising materials for household refrigeration—in newspapers, magazines, direct-mail, and radio; the engravers and printers who assemble this material in its final form; the newspapers (daily, weekly, and neighborhood), magazines, and other publications who derive a large portion of their revenue from this source; the railroads, and other transportation agencies who carry the refrigerators from factory to distribution center, from there to the retail store, and eventually to the purchaser's home; the rentals paid by distributors and dealers for showroom, office, and servicing space; taxes paid to their individual communities by these distributors and dealers—and you have a fairly comprehensive idea of how importantly the household refrigerator industry figures in the social and economic life of the United States.

How is household refrigerator distribution accomplished? For the answer to that question, let's follow the path of a single unit from factory to consumer, noting briefly the various steps involved:

At the factory are complete staffs handling the sales, sales promotion, advertising, service, home service, and sales training problems of household refrigeration as they apply primarily to distributors.

The sales staff, in addition to the sales manager and his assistants, includes the factory field force, headed by regional managers, each of whom covers a wide section of the country. There may be four or more such regional men, working under whom are district managers who divide the regional territory so that more attention may be given the individual problems of the various distributors.

The advertising department has the job of correlating all advertising and promotional material, working with the sales and promotional departments on ideas for more effective distribution, as well as with the factory appointed advertising agency on how these ideas may best be worked out and put into effect.

Maze of Organization

Job of the service manager and his assistants is to instruct members of distributor servicing organizations in the proper maintenance of the units, by means of factory schools and short-courses, and by the issuance of regular bulletins covering one phase or another of the servicing and maintenance problems involved in one particular model or another.

The factory home service organization is concerned primarily with promoting the "use value" of the refrigerator—in emphasizing those particular features which are most apt to interest the housewife as she employs her new refrigerator in her daily household kitchen tasks. Home service schools, regular bulletins to distributor and dealer home economists, the preparation of recipe and dessert booklets, and appearances before cooking schools and various other women's organizations are only a few of the means by which this department does its work.

Sales training department, usually closely tied-in with the advertising and sales promotion activities of the manufacturer, reaches both distributor and dealer salesmen with a fund of ideas as to how the sales story of the household refrigerator can be presented most effectively.

All of these branches of the factory organization play a vital part in speeding the journey of a household refrigerator from the factory production line to its ultimate destination, the home. However, their efforts, essential though they be, provide merely the "first leg" of the three-step trip. That part of it involving the final—and even more important—steps depends on the household refrigerator distributor and his dealer organizations.

The Distributor Function

In miniature, the distributor or factory branch operation duplicates to some extent the factory organization. There are sales, advertising and promotion, service, home service, and sales training divisions, which carry on their work with dealers and salesmen, the final links in the distribution chain.

Under the sales managers are the distributor field men—the men who are in constant contact with dealers in relatively close-knit sections of the distributors territory—the men who work with dealers on all of their business problems—the men who may help the dealer in planning advertising, hiring or firing salesmen, participating in shows and exhibitions—the men who are, in fact, the "manufacturer" as far as the average dealer is concerned.

The distributor's advertising department also works with dealers in the placing of their advertising material, direct-mail, and other promotional pieces, and in the planning and production of special campaigns which one dealer, or a group of dealers, may want to underwrite in a particular section of the territory.

Final link in the distribution chain is the dealer—and of all the services, his is the most important, for it is through him and his organization that all of the health and food-protecting benefits of modern electric refrigeration eventually reach the home.

Getting a picture of the "average" dealer and his operation is complicated by the fact that, in all likelihood, "there ain't no such animal." Retail organizations range in size from two or three-man operations to those employing a score or more in their sales, servicing, home service, and office departments.

Dealer Is 'Independent'

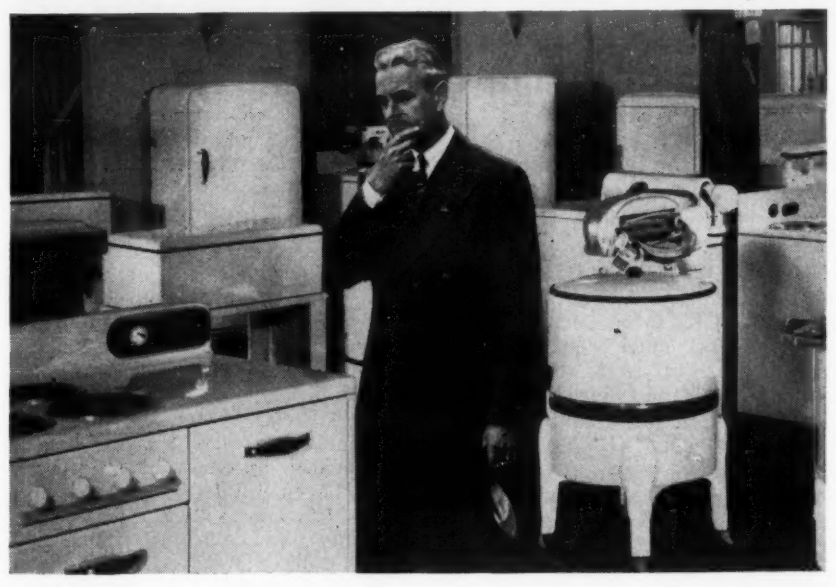
In most retail organizations, however, the management of sales, advertising, and promotional activities usually are handled by the head of the firm. His job it is to employ and train retail salesmen, select and direct distribution of direct-mail pieces, place advertising for his firm in neighborhood or weekly newspapers, and in general carry the executive load.

The retailer either maintains his own servicing department, or has a "working agreement" with a reputable independent servicing organization, to insure proper operation of all the household refrigerators sold by him in his territory.

Larger retail organizations may have separate sales and advertising divisions, and the largest of these sometimes bolster their staffs with the addition of a home economist, whose most important task is to "follow through" on each refrigerator to insure that the new owner understands how to use it to best possible advantage.

In the smaller dealerships, this important follow-up work is done by the salesmen, all of whom should be equipped to outline the various "use advantages" of the equipment.

The Appliance Dealer—Independent Businessman—Ponders His Future as Curtailment Threatens



In addition to being, in most communities, a sizeable employer of sales, office, and service workers, the retail dealer figures importantly in many other aspects of community life. Usually his place of business is selected for its traffic-pulling possibilities—placing him in the above-average class as far as rental and real estate values are concerned.

In the maintenance and upkeep of his headquarters, he probably figures more than any other one businessman in his community in employment given to carpenters, painters, electricians, and workers in other building trades. Calling attention to his showroom by means of electric signs and effective lighting, he is an important user of electric power facilities. Participation in cooking schools, exhibitions, fairs, and similar events makes him a major contributor to his community's educational, social, and economic life.

Next to food and clothing stores, he is probably the most important single "account" to his local newspapers. If there is a radio station serving his territory, he's likely a buyer of "time" on it.

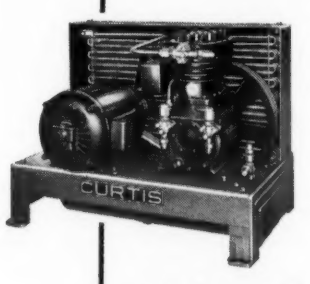
If he owns his own business home, it's generally in a location where the assessment rate is fairly high—and if he's had a good year, he's a large income-tax "contributor."

To Meet ALL Your Refrigeration Needs

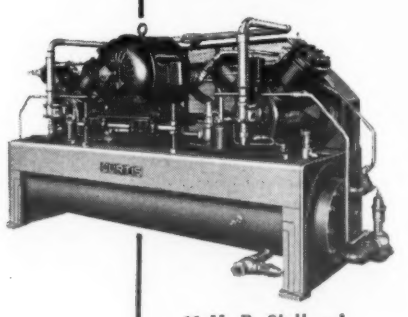
The CURTIS Line

Includes 93 Condensing Units—

1/6 to 50 Tons Capacity

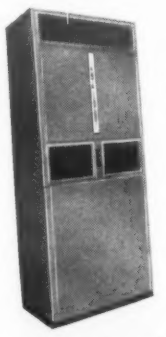


1 H. P. Air Cooled Unit

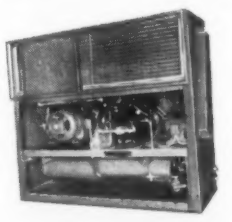


15 H. P. Shell and Tube Unit

Packaged Air Conditioners



In addition to condensing units for every type of application, Curtis offers Packaged Type Air Conditioners in 5 sizes: 3, 5, 7½, 10 and 15 tons capacity.



Whatever your requirements, whatever your markets in the field of commercial refrigeration, you can meet practically every need with the complete Curtis line of quality-built condensing units.

Curtis offers 45 air-cooled condensing units from 1/6 to 5 H. P. In air-cooled types, and 48 water-cooled units from 1/3 to 50 H. P. capacity. Curtis saturated air condensers are also available for installations where water conservation is an important factor.

Curtis provides these advanced design engineering advantages:

Centro-Ring Positive Pressure Lubrication
Timken Tapered Roller Bearings (models above 3/4 H.P.)
Removable Cylinder Heads
Drop Forged, Alloy Steel Heat Treated Crankshafts and Rods
Balanced Sylphon Bellows Seal
Exceptionally Large Condensers and Receivers

Throughout the industry, Curtis products have a remarkable record for dependable, trouble-free economical performance—the result of long experience, precision manufacture and advanced features of engineering and design. Every Curtis condensing unit is backed by Curtis' record of 87 years of successful manufacturing experience.

Whether you sell, buy or specify commercial refrigeration equipment, it will pay you to write for full information on the complete Curtis "Extra Value" line.

CURTIS REFRIGERATING MACHINE DIVISION
of Curtis Manufacturing Company

1912 Kienlen Avenue St. Louis, Missouri

CURTIS REFRIGERATION AIR CONDITIONING AND COMMERCIAL

See Curtis at the
1941 Dairy Industries Exposition — Toronto, Ont.
October 20-25, 1941 Booth No. 100F

Blower Units With Special Defrost Method Cut Operating Cost and Save Manpower For Big Warehouse

Records Show How Modernization Boosted Efficiency

By H. G. Kirkwood, Refrigeration Engineering, Inc., Los Angeles

For years large packing houses and wholesale cold storage warehouses have been reluctant to trust their large jobs to modern and up-to-date cooling coils. This, we believe, is due in part to lack of knowledge of the merits of new methods, and in part, shall we say, to one bad apple in the barrel spoiling all the good ones.

Much of this lack of knowledge is due, no doubt, to the fact that the refrigeration men turn their energies to making a sale of some cooling equipment rather than going into the individual problem with the prospect from an operating cost, net profit, and amortizing angle of the modern equipment versus the bare pipe coils.

BLOWER COIL ADVANTAGES

The initial cost of blower coils ofttimes is so much less than pipe that the prospect is prone to view with suspicion the claims made for blower coils, and, too, there are many who do not know that higher humidities and more consistent room temperatures are the rule rather than the exception with blower coils.

Hyland Hinman, manager of the Haslett Warehouse of Oakland, Calif. (one of the largest warehouses in the West), and his chief engineer, James R. Payne, have graciously supplied some of the following data, which we submit in support of the foregoing statement.

LETTER FROM WAREHOUSE

Haslett Warehouse Co.
Oakland, Calif.

Refrigeration Engineering, Inc.
Los Angeles, Calif.

Gentlemen:

After a year's operation of the water defrost coils, I am reminded of my promise to report results.

In reviewing the job, remember that the pipe coils had been ordered by us when your coils were brought to my attention. To make the decision to use a new product where 800,000 lbs. of frozen butter, eggs, and vegetables were to be stored after the purchase of pipe coils had been made, is unusual, to say the least.

Our pipe coils, as engineered, would have required 6,585 cubic feet. The 13 ceiling type blower coils required only 1,950 cubic feet, a net gain in storage space of 4,636 cubic feet. Our added revenue from gained storage space will eventually pay for the entire installation.

Operating a large commercial cold storage plant, with many facts and figures to guide us, we do not hesitate to say that you have made a worth-while contribution to the cold storage industry with the water defrost coils.

We are more than just satisfied.

HYLAND HINMAN,
Manager, Oakland Division

ENGINEER'S VIEWS

Haslett Warehouse Co.
Oakland, Calif.

Wyatt R. Brown Co.
San Francisco, Calif.

Gentlemen:

Following are the facts observed by the writer of one of the refrigerated rooms of the Haslett Warehouse using Recold water defrost coils.

The room size is 103 feet long by 30 feet wide by 10 feet high, 15 feet of which are used as an ante-room held at 0° F., and the balance is held at minus 10° F., and a product load of 831,000 lbs., valued at approximately $385,500.

Nine thousand feet of 2-inch ammonia pipe was ordered and en route for the job. The following comparative list of facts motivated the use of water defrost coils in lieu of the above pipe.

	Pipe	Recold W.D. Coils
Model	9,000 ft. of 2"	12 A2500 LT
Weight	45,000 lbs.	6,032 lbs.
Extra Trussing	Yes	No
Coil Cost	100%	75%
Labor	3 men	2 men
Labor Time	4 weeks	7 days
Space Required	6,586 cu. ft.	1,950 cu. ft.
Space Gained	———	4,636 cu. ft.
Compressor Running Time	75 to 100%	30% less
Defrosting Time	3 men 2 days	1 man, 3 min./coil
Box Temp.	Varied	Consistent
Compressor Back Pressure	8.7" vacuum	4 lbs.

JAMES R. PAYNE

COLD STORAGE ROOM

The cold storage room is 103 feet long by 30 feet wide by 10 feet high, having a total of 8,840 sq. ft. exposed surface. Six inches of board cork was used in the walls. Based on 80° ambient temperature, 0° ante room, and minus 20° storage room, the total heat leak and service is 68,812 B.t.u. per hour. Added to the product cooling of 65,033 B.t.u. per hour, this gives a total load of 133,845 B.t.u. per hour.

To balance this load, 13 Recold water defrost coils were installed, having a combined capacity of 137,384 B.t.u. per hour at 8° F. T.D., which would give approximately 85% relative humidity in storage space. These 13 coils are hooked to an insulated accumulator tank 14 inches by 6 feet high on the roof above the coils.

FLOAT SWITCH CONTROL

The ammonia level in this tank is controlled by a float switch which actuates a solenoid valve in the liquid line to the coils. The ammonia leaving the solenoid valve goes through a Phillip's injector properly sized to maintain a fairly constant flow of ammonia.

This injector principle causes the ammonia to circulate through the coils in the same manner as it would if liquid ammonia were being pumped through the coils in a circulating system.

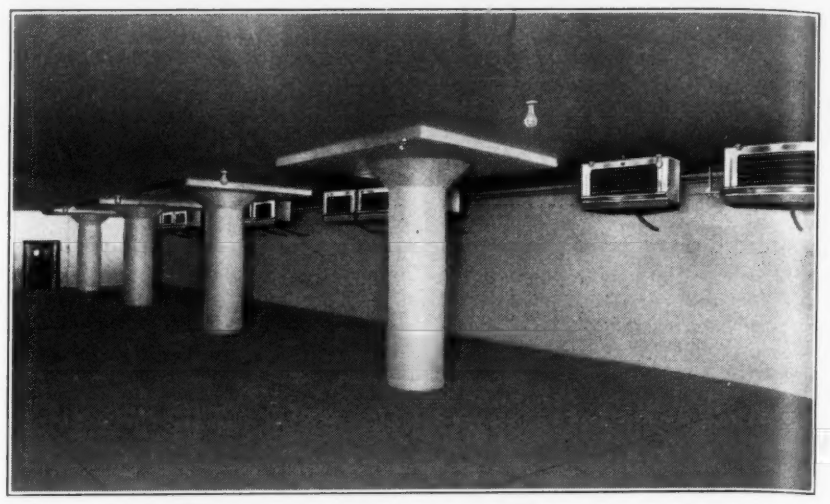
The ⅛ inch orifice in the injector supplies sufficient velocity to take the place of a liquid ammonia pump. The 3½-inch suction main runs from the accumulator tank to the suction manifold of a Baker compressor. Note: In the drawing showing the hookup of this system, expansion valves are entirely eliminated.

The prevailing question usually asked about water defrost coils is, "What keeps the water from freezing?" The answer, of course, is that the water is in motion all the time while in the sub-zero atmosphere, and refrigeration is stopped within the coil during the five minutes' defrosting time. When we consider that every pound of water contains 144 B.t.u. of latent heat, it is not difficult to understand why water, even at the low temperature of 32° F., still has sufficient heat to adequately melt the frost accumulation from the fins of a coil.

Another thought not to be overlooked is that the coil, when defrosting, never reaches a warmer temperature than approximately 34° F., which would be equal to an internal gas pressure of 31.72 lbs. of "Freon-12" or 50.2 lbs. of ammonia. Unlike other methods of defrosting, critical pressures are not experienced at any time.

The manufacturer recommends a five-minute defrosting period for each coil every 24 hours. However, the Haslett Warehouse Co. finds that they need only defrost their coils once each week. The required defrosting periods are contingent on the amount of service the storage room would have.

Something New In a Warehouse



Blower units instead of pipe coils were installed in the warehouse shown above with considerable savings in space, costs, and labor—enough in fact to make the once-skeptical management enthusiastic boosters.

Illinois State R.S.E.S. To Meet Oct. 18-19

AURORA, Ill.—Annual convention of the Illinois State Association of Refrigeration Service Engineers Society will be held at the Leland hotel here on Saturday and Sunday, Oct. 18 and 19, announces Willis Stafford, chairman of the program committee.

An interesting and diversified educational program has been planned for the meeting, which has been arranged so as to keep service men away from their duties as short a time as possible. Annual banquet will be held on the night of Oct. 18.

John Clark Joins Service Dept. of Traylor

NORLINA, N. C.—John Clark, formerly connected with the Norlina hotel, is now working on outside service for the Traylor General Electric dealership here.

NO SERVICEMAN CAN AFFORD TO BE WITHOUT THIS ALL-WEATHER PROFIT-MAKER

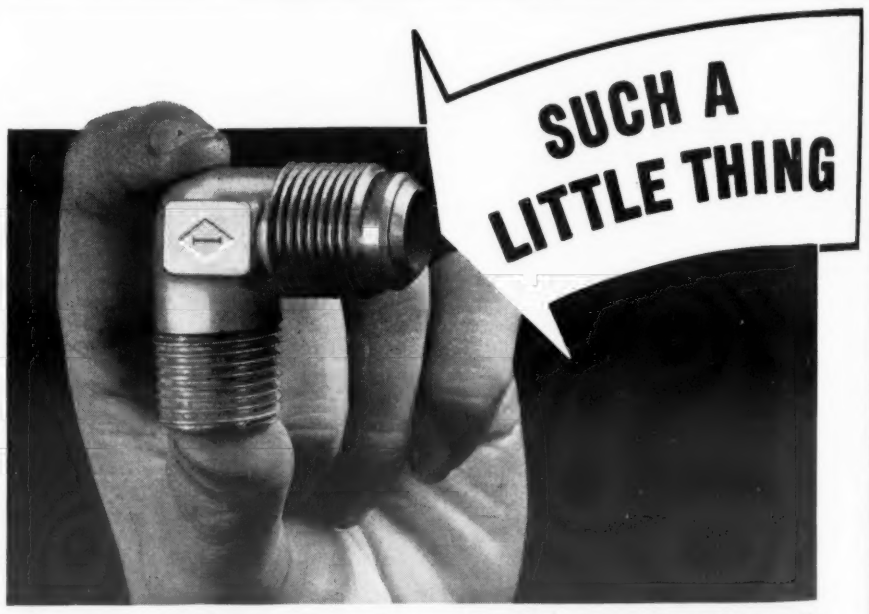
Compact—Durable—Easy to Handle

Get the Dayton V-Belt Service Kit for "on the job" V-Belt replacement service and save call-backs, delays and customer squawks. Easy to handle, this compact, durable Swedish Fibre case contains an

Open on the Job—43 Belts at Your Finger Tips

assortment of 43 fractional horsepower V-Belts at your finger tips plus a handy V-Belt Matchometer. Here's the portable, profitable answer to "on the job" V-Belt replacements for all leading makes of automatic refrigerators including Frigidaire, General Electric, Kelvinator, Norge, Westinghouse and others. Costs only $23.48 and pays for itself out of gas and oil savings.

ASK YOUR DISTRIBUTOR FOR DETAILS OR WRITE TO
THE DAYTON RUBBER MANUFACTURING COMPANY, DAYTON, OHIO
WORLD'S LARGEST MAKERS OF V-BELTS



—AND YET SO VITAL!

YOU can't connect up tubing with friction tape and expect the system to work . . . and when the butcher shop down the street calls for service help you can't expect the butcher to wait while you write to Washington for a priority order.

That's why we believe the Refrigeration Service Man has an increasingly important function to perform. He not only is going to continue to have the installation job on new systems that must, of necessity, be installed, but he is going to have to place even greater emphasis on selling *protection*.

Next year there is going to be a greater need for inspection and servicing of systems than ever before. The owner can readily be sold the idea that every unit *must* be protected—must be watched—must be repaired before serious trouble has a chance to start.

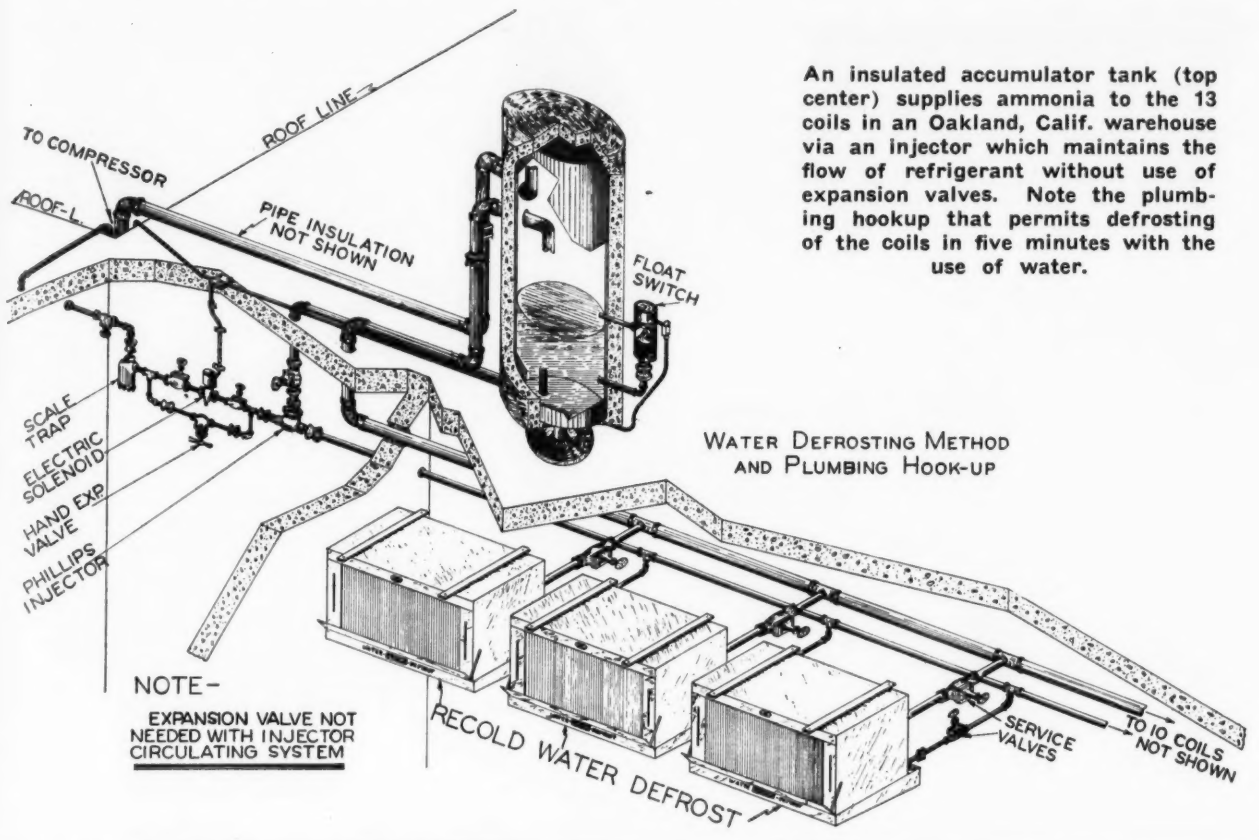
Imperial is making every possible effort to take care of the requirements of refrigeration service work in addition to speeding up the work that is related directly to national defense.

Imperial Triple Seal Flared Fittings are small items, but since the very life blood of a refrigerating system may depend upon them, we shall do everything in our power to help your jobber supply these fittings and other Imperial products for air conditioning and refrigeration work.

THE IMPERIAL BRASS MFG. CO., 565 S. Racine Ave., Chicago

IMPERIAL Air Conditioning and Refrigeration Products

How Refrigerant Is Supplied To Coils In Warehouse



An insulated accumulator tank (top center) supplies ammonia to the 13 coils in an Oakland, Calif. warehouse via an injector which maintains the flow of refrigerant without use of expansion valves. Note the plumbing hookup that permits defrosting of the coils in five minutes with the use of water.

WATER DEFROSTING METHOD AND PLUMBING HOOK-UP

Some Army Forts Use Air Conditioning For Shell Storage and Magazine Rooms

SYRACUSE, N. Y.—The large variety of ways in which refrigeration and air conditioning is being put to use by the Army is illustrated in information gathered by Carrier Corp. from its dealers who have made the installations.

One of the most interesting of these direct defense jobs is one now being completed by Lutz Engineering Co., Inc., Providence, R. I., for Fort Church in Rhode Island.

The equipment is being used for shell storage, magazine rooms, and plotting rooms. Five separate and individually engineered air conditioning systems are used on the job, with nearly the entire range of year-around air conditioning equipment finding a place—including condensing units, air handling units, evaporative condensers, and boiler burner units.

Low temperature air conditioning systems have been installed for Bowman Field mess hall at Bowman Field, Kentucky and at Fort Buchanan in Puerto Rico, West Indies. A part of this equipment has the unusual function of the storage of parachutes to prevent mildewing.

Fort Monmouth, New Jersey, also has a low temperature air conditioning system for various purposes.

The greatly increased need for office space for Army officials and War Department workers in the warmer climates has also brought about a need for air conditioning. As an example, a temporary office building that has been taken over by the U. S. Army in Washington, D. C., has installed four large condensing units with four large evaporative condensers and two central station air conditioning systems to supply comfort air conditioning for the workers in this building. The job was sold through the United Clay Products Co., Carrier dealer in the capital.

In addition to this, there are many installations reported by Carrier dealers in army posts scattered throughout the country handling the routine installations for the preservation of large varieties of foodstuffs, necessary in every army cantonment.

Charles H. Roberts of Johns-Manville Dies

NEW YORK CITY—Charles H. Roberts, 51, treasurer of Johns-Manville Corp., died here Sept. 10 in Doctors Hospital of a heart ailment.

Starting his business career in 1907 with John A. Roebling's Sons Co., as head of the cost department, Mr. Roberts later served in the financial departments of Mercer Automobile Co., Hess-Bright Mfg. Co., U. S. Rubber Co., Splitdorf Electrical Co., and Julius Kayser & Co. He joined Johns-Manville in 1928 as assistant general auditor.

Army Ordnance 'Shopping List' Sent To OPM Field Offices To Aid Contractors

WASHINGTON, D. C.—A "shopping list" of items that the Army Ordnance Department wants to buy has been sent to OPM field offices in 39 cities for the information of prospective contractors and subcontractors.

This information as to material wanted under the Ordnance Department's new $2,888,980,486 program will be made available to responsible manufacturers in line with President Roosevelt's policy of helping small business units of the country obtain a fair share of defense orders.

The list includes shells, guns, gun mounts, gun carriages, bombs, fire control equipment, pistols, rifles, and power trains—consisting of transmissions, controlled differentials, and final drive units—for tanks.

Detailed information of value to prospective producers is included concerning each item.

LOCATION OF OFFICES

OPM field offices, where the "shopping list" of ordnance items will be available to responsible plant owners, are located in Federal Reserve Banks and branch banks in the following cities:

Atlanta, Baltimore, Birmingham, Ala.; Boston, Chicago, Cleveland, Dallas, Tex.; Denver, Detroit, El Paso, Tex.; Helena, Mont.; Houston, Tex.; Kansas City, Mo.; Little Rock, Ark.; Los Angeles, Louisville, Ky.; Memphis, Tenn.; Nashville, Tenn.; New Orleans, New York City, Oklahoma City, Omaha, Neb.; Philadelphia, Pittsburgh, Portland, Ore.; Richmond, Va.; Salt Lake City, San Antonio, Tex.; San Francisco, and St. Louis.

Other OPM field offices, where the list also will be available, are as follows:

Buffalo—212 Traders Bank Bldg.; Charlotte, N. C.—New Liberty Life Bldg.; Cincinnati—Union Trust Bldg.; Des Moines, Iowa — 505 Crocker Bldg.; Jacksonville, Fla.—504 Hildebrandt Bldg.; Milwaukee—1124 First Wisconsin National Bank Bldg.; Minneapolis—240 Rand Tower Bldg.; Newark, N. J.—176 Sussex Ave.; Seattle—National Bank of Commerce Bldg.

Rebuilding Firm In Los Angeles Headed By A. H. Reinach

LOS ANGELES — Refrigeration Rebuilding Co. has recently been opened at 1015 West 2nd St. here to do rebuilding and refinishing work on all types of refrigeration equipment and parts for this equipment. General manager of the new organization is A. H. Reinach, West Coast manufacturers' representative, and W. J. Hammond is shop manager.

The company offers rebuilding service on such products as condensing units, ice cream cabinets, beverage and water coolers, room coolers, display cases, truck equipment, soda fountains, electric motors, coils, valves, tanks, and refrigerators.

With a shortage of new products, the company believes that dealers, service companies, ice cream manufacturers, and other large users will find such a rebuilding service of considerable use in preserving present equipment at less cost, rather than replacing with hard-to-get new products.

Idea of the rebuilding service ties in very well with the manufacturers' representative agency, Mr. Reinach declares, in assisting those eastern companies which the firm represents in the event of unusual mechanical difficulties that may be encountered by distributors or quantity purchasers.

PROTECTION AGAINST FUMES!

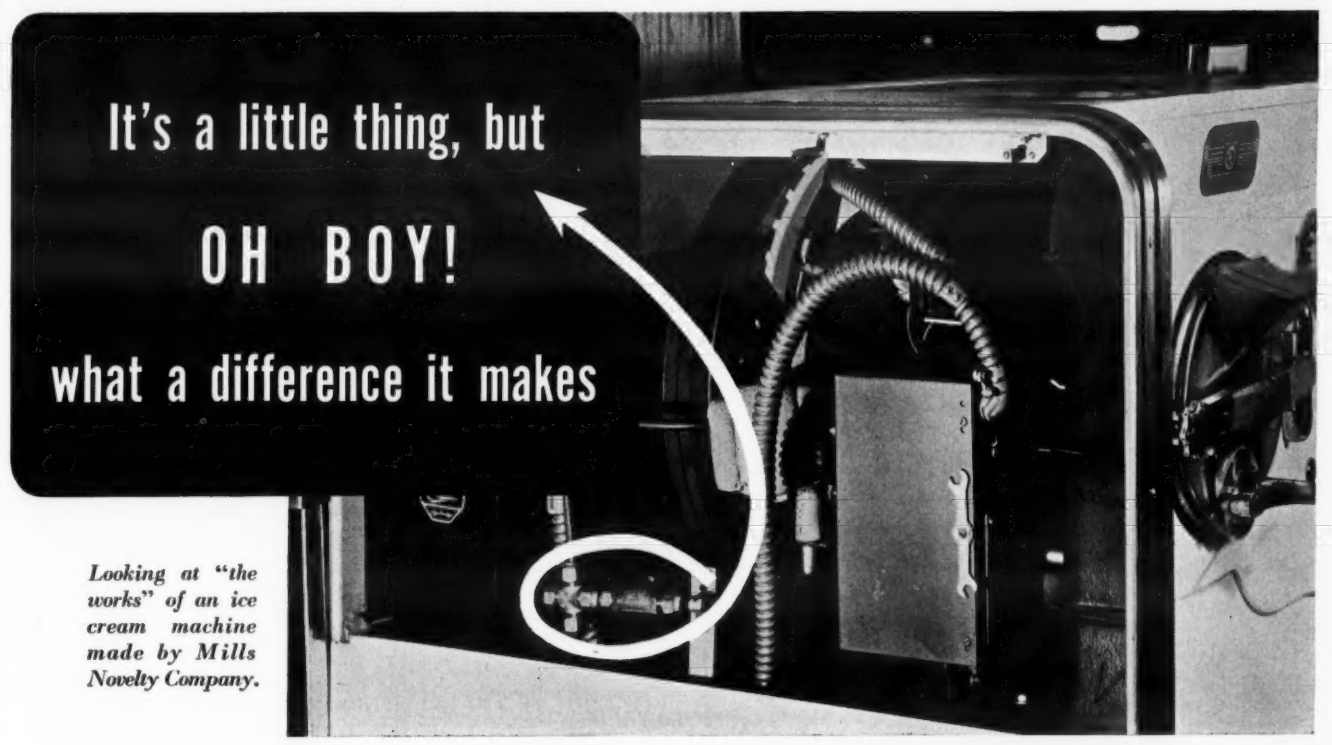
Supply your workers with this compact, comfortable, efficient

1600 FUMEGARD

Always have your men carry a No. 1600 Fumegard Face Mask and they can go right to work—safely—in any concentration of Sulfur Dioxide, Ammonia or other refrigerants. This husky, compact mask is built for heavy duty service—yet is comfortable, permits easy breathing, full vision and freedom of action. Designed on latest gas mask principles, the 1600 Fumegard provides excellent protection and utmost serviceability. Order a 1600 Fumegard today. It will serve long and well, at reasonable cost.

Pulmosan Safety Equip. Corp.,
Dept. AC, 176 Johnson St., Brooklyn, N. Y.

WRITE TODAY
for literature giving full details and new low price.



Looking at "the works" of an ice cream machine made by Mills Novelty Company.

That's a Kerotest dehydrator cartridge, charged with Alorco Activated* Alumina. Placed permanently in the system, it dries the refrigerant DRY, and keeps it that way.

Mills Novelty Company protect all their refrigerating machines in this way. No waiting for trouble-making moisture to show its hand with frozen valves, corrosion, and the formation of sludge. Mills get the jump by eliminating it. The Activated Alumina takes out every trace of moisture.

Alorco Activated Alumina is doing this same efficient, dependable drying job for many manufacturers and users of refrigerating equipment, large and small. And by removing acid from the system, regenerating the oil, it prevents corrosion and reduces wear.

Your supply house can furnish cartridges and dehydrators charged with Alorco Activated Alumina. ALUMINUM COMPANY OF AMERICA (*Sales Agent for* ALUMINUM ORE COMPANY) 1908 Gulf Building, Pittsburgh, Pennsylvania.

*Registered Trade-mark

These manufacturers supply dehydrators charged with Activated Alumina:

American Injector Co.
Fedders Mfg. Company
Henry Valve Company
Imperial Brass Mfg. Co.
Kerotest Mfg. Company
McIntire Connector Co.
Mueller Brass Company
Cyrus Shank Company

★ ALORCO ★
ACTIVATED ALUMINA
DRIES REFRIGERANTS DRY

"Refrigeracion Domestica" is one step in answering this problem for the refrigeration industry—

LANGUAGE BARRIER HURTS LATIN TRADE

Lack of Technical Handbooks in Spanish Major Obstacle, Armco Official Says

Lack of sound Spanish translations of technical handbooks, textbooks and other literature produced in this country for the use of Latin-American engineers is a serious handicap to the development of closer commercial relationships between this country and the Southern republics, George W. Warner, general manager of the Armco International Corporation, contended last week in a letter to THE NEW YORK TIMES. Mr. Warner's company [illegible] the use of different systems of weight and measurement in the two continents.

"The situation is complicated also by the fact that the Latin-American market is not so organized by most firms that experienced salesmen can be sent out on any serious inquiry within twenty-four hours, but rather full details must be given to the trade in the translated versions which permit them to do a pretty complete job without assistance in many cases."

One of the most serious obstacles encountered in attempting to present a Spanish edition of technical books is that it is extremely difficult to develop technical engineering terms with any assurance that they will be satisfactory in all the countries in which the books may be used. There is no single authority for terms here or in South America, he added.

"Another serious problem," Mr. Warner continued, "is faced in converting many of our North American engineering formulae to the metric system. This is a formidable task, particularly in the hydraulic field where conduction figures are not merely a case of multiplication to put them into the metric system but require correlation of diameters, velocity, coefficient of friction, etc.

"Although Latin America must have information based on the metric system, North American manufacturers cannot generally afford to shift their production standards from the English system, with the result that many tables must be printed in both systems.

"These are but a few of the complications encountered and which seem to me to indicate that there is a very large field for effort along this line if we are to continue to hold the unquestioned advances developed under present crisis conditions."

Reprinted from The New York Times

"Refrigeracion Domestica" currently is receiving widespread acclaim in Latin-America.

The clarity and completeness of "Refrigeracion Domestica" overcomes this obstacle in the Latin-American market. It is a complete Spanish translation of the popular Master Service Manual No. 1 on household refrigeration. The contents are easily understood without professional assistance.

The translation for "Refrigeracion Domestica" was done by J. Prida and N. J. Betancourt, refrigeration engineers of Havana, Cuba. Their translation is in the "working language" of refrigeration mechanics, and is understandable to Spanish-speaking people everywhere regardless of local dialects.

Tables and all other mathematical data in "Refrigeracion Domestica" are given in both metric and the equivalent English units of weight and measurement, with headings in Spanish and English.

Master Service Manual No. 2 will be available in Spanish soon.

"Refrigeracion Domestica," Manual No. HS-1, contains 126 illustrations, 216 6" x 8½" pages. Single copies are available at $2.00 in U.S.A.* Quantity prices are as follows:

1–9	$2.00 each
10–99	$1.75 each
100–499	$1.50 each
500 & over	$1.35 each

Send for free folder.

*Add 50¢ for each package of six books or less for shipments outside U. S. A.

BUSINESS NEWS PUBLISHING CO.
5229 Cass Ave., Detroit, Mich.

Aggressive Selling Reduced Refrigerator Prices, And Got Them Into Low-Income Homes

Bulk of Sales Now Replace Worn-out Equipment, Or Go Into Homes Where the Yearly Income Would Once Have Hardly Purchased One

PROBABLY no man foresaw the burst of production and merchandising power that yearly boomed household refrigeration sales from 75,000 units in 1925 to almost 3,000,000 in 1940—with successively higher totals in all but three of these years.

During the depression-ridden thirties, the industry prospered by making one of the greatest demonstrations of specialty selling ever seen in America, placing electric refrigeration in 50% of the wired homes in the United States. Trainloads of actors toured the country in refrigeration shows. Sales conventions were held on cruise ships and tropical islands. Measured in specialty stunts alone, those were colorful years.

When the decade ended, sales analysts pointed to a future of bulk sales to lower income groups and a growing percentage of replacements.

PRODUCTION

Twenty-five manufacturers and assemblers now market household electric refrigerators in the United States. Their 1941 sales quota of 3,000,000 units has a retail value of close to $500,000,000.

Twelve of the twenty-five household refrigerator manufacturers are known as complete unit producers. They build their own cabinets and compressors. The rest buy cabinets on contract from four of the twelve, or from a group of five independent cabinet makers serving the industry.

Motors, coils, insulation, hardware, breaker strips, and numerous other fabricated parts are purchased from a large variety of suppliers—some of whom devote their entire production to the industry.

DISTRIBUTION

Three major distribution methods are used:

1. Distributor-Dealer—The most widely used and most productive method to date. The manufacturer wholesales units to independent distributors or company-owned branch offices, who distribute them through retail sales outlets of various types (independent appliance dealers, furniture or department stores, public utilities, auto supply houses, hardware stores, etc.).

2. Direct to Dealer—The manufacturer sells directly to the retail dealer, using field men for dealer-contact work. Two organizations, Sears-Roebuck and Montgomery Ward, sell by mail, and through company-owned stores.

3. Private Brand—The manufacturer sells his product to national or regional marketers who retail the units under their own names.

(Concluded on Page 33, Column 1)

Household Refrigerator Sales by Years

Estimated World Sales by All U. S. Manufacturers by Years

Year	No. of Units	Average Retail Price	Retail Value
Up to 1920	10,000	$600	$ 6,000,000
1921	5,000	550	2,750,000
1922	12,000	525	6,300,000
1923	18,000	475	8,550,000
1924	30,000	450	13,500,000
1925	75,000	425	31,875,000
1926	210,000	390	81,900,000
1927	390,000	350	136,500,000
1928	560,000	334	187,040,000
1929	840,000	292	245,280,000
1930	850,000	275	233,750,000
1931	965,000	258	248,970,000
1932	840,000	195	163,800,000
1933	1,080,000	170	183,600,000
1934	1,390,000	172	239,080,000
1935	1,688,000	166	280,208,000
1936	2,180,000	164	357,520,000
1937	2,500,000	171	427,500,000
1938	1,410,000	172	282,520,000
1939	2,085,000	169	352,365,000
1940	2,720,000	154	418,880,000
First 6 Mos. 1941	2,582,000		

Household refrigeration has been restricted because of heavy use of raw materials, such as zinc, copper, steel, and aluminum. Until substitutes were devised, aluminum consumption equalled 12,000,000 or more pounds per year. Steel consumption averaged 300,000 tons.

Thousands of **WAGNER** *Motors*
ARE NOW GIVING DEPENDABLE SERVICE ON REFRIGERATING AND AIR CONDITIONING EQUIPMENT IN DEFENSE INDUSTRIES, ARMY CANTONMENTS, NAVAL STATIONS, ON SHIPS, ETC.

FOR QUICK DELIVERIES ON MOTORS FOR DEFENSE PRODUCTION SPECIFY WAGNER

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Type RK, Capacitor-Start Induction-Run (1/8 to 3/4-hp).

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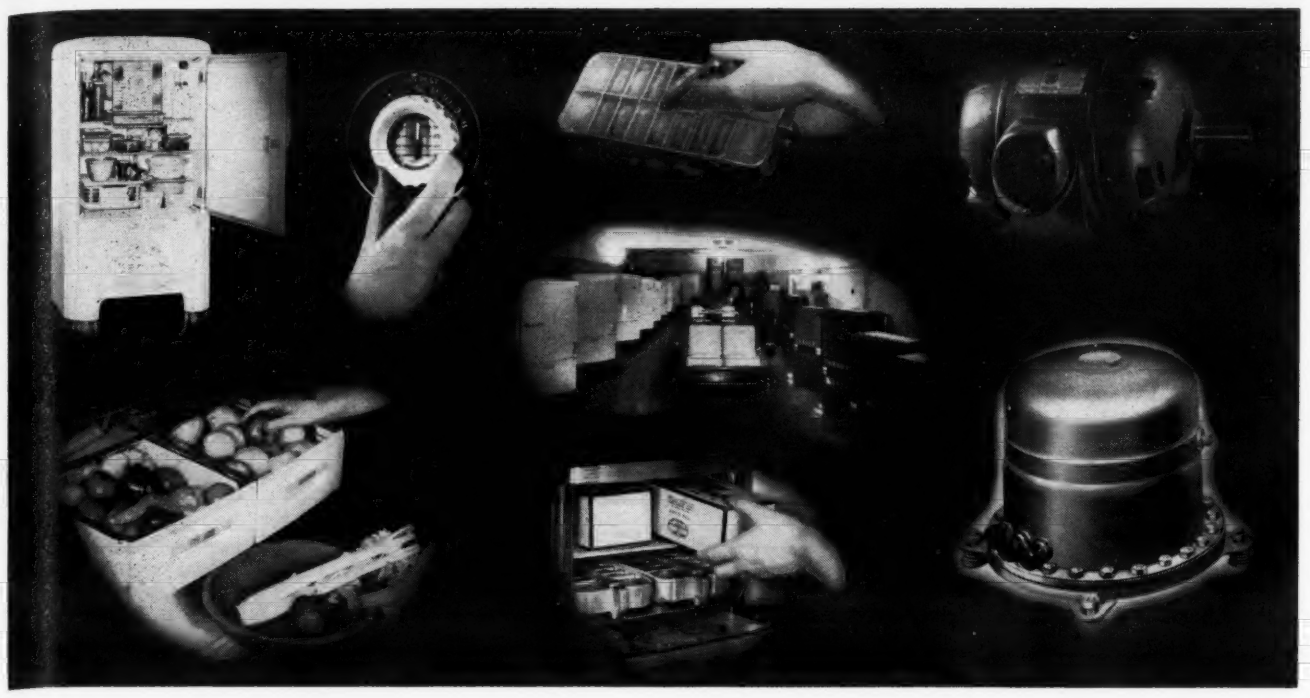

CURRENT MARKET TRENDS

(Concluded from Page 32, Column 5)

Because the household refrigeration industry faces a relatively high saturation level in the middle and upper income groups, today's largest sales potential seems to lie among lower income groups, and particularly among buyers enjoying defense-swelled family budgets.

Actually, this is not necessarily the greatest potential market. It is estimated that there are today more than 7,000,000 household refrigerators in the field which are more than seven years old. Replacement refrigerators, with all their basic new features, can be sold to this market, composed largely of upper income buyers.

Each year from now on more than a million household refrigerators will wear out and need replacement. That comprises a major market in itself.

Also, in the period of restricted production, price leaders will be sacrificed for profit models. A tangible opportunity exists for selling higher priced, more profitable models to large numbers of new home buyers, and of replacing units of inadequate size purchased in past years by middle class families. But it looks more and more as though dealers will put their selling effort on new users, broadening future replacement markets.

MERCHANDISING

Merchandising effort has changed radically in late years. In "facts labels" and literature manufacturers specify component parts. To a considerable extent they use those parts to sell their products. Every piece of equipment which has saleable qualities is exploited.

Dealer approval is important to manufacturers who are in hard competition to secure superior outlets in this industry where 10% of the dealers sell 90% of the refrigerators. Restricted production will emphasize this competition.

SERVICE TRENDS

A big and growing field in the industry is the production and distribution of replacement parts. Complex and unorganized, this field's importance will be greater than ever when priorities curtail production of new units. Recognized as essential to public welfare, replacement parts have been promised a priority rating of A-10.

Naturally, manufacturers of parts, original or the "just as good" variety, are going to be in fighting competition for the business. They are going to sell as hard as they can to dealers' service departments, to independent service firms, and to service men.

In between is the jobber, who sells to small manufacturers and service men—a wholesaler who handles a variety of lines—boosts those with the best combination of profit and quality.

Relatively a newcomer on the scene is the rebuilder. Taking about half of the trade-ins—which figure 25% of sales—scores of companies are rebuilding these units for export, for lower income families, summer cottages, etc. Rebuilt refrigerators will attain higher values as production of new units is curtailed.

HOW ABOUT PRIORITIES?

Late in July, the Office of Price Administration and Civilian Supply slashed production limits to 1,500,000 units a year—a 50% cut. The order went into effect Aug. 1. Without aluminum and copper and stainless steel—with rationing on other materials—the opportunity is wide open for the development of substitutes. They are being developed, and it's a golden opportunity for those who would drive an entering wedge into a mighty industry.

But it is no mean market as it stands. Better than a quarter of billion dollars will still be spent for new units and replacement parts each year.

Retailers Think 'Supply and Demand' May Further Tighten Time Selling

NEW YORK CITY—Belief that present credit restrictions are only preliminary and will be tightened still more within the next 90 days or so to take care of the smaller amount of durable goods that will be available was expressed in retail quarters along with reports that both customers and retailers here took the new instalment regulations in stride.

"If today there are 100 refrigerators available for 100 customers, the present down payment basis is sufficient," a well known credit official is quoted as saying. "But when there are 100 customers for 25 refrigerators, it will be found necessary to increase the down payment if for no other reason than to bring demand more nearly into balance with the supply."

Business was reported continuing at the same active pace and retail executives said no difficulty was encountered in obtaining the larger down payments. No serious objection to the 18-month limit was heard.

A. B. Buckeridge, director of the Credit Bureau of Greater New York, said there were no indications that customers could not meet the new terms, and saw the regulations making for "cleaner" instalment selling, minus the unsettling competition in easy terms which had previously marked this field. One merchandising official of a large store, in reporting that the number of customers in the home appliance sections was "normal," said purchases were stimulated because of the anticipated increased federal taxes on this merchandise, while a retail credit executive commented that many customers appeared to be motivated by fear that they will be unable to get merchandise later because of defense priorities.

Maytag To Build Parts For Martin Bombers

NEWTON, Iowa—Maytag Co. will soon start to manufacture parts for American and British bombing planes to be made by the Glenn L. Martin Co. of Baltimore under a $1,500,000 contract on which negotiations have recently been completed.

"We are very hopeful the work provided by our defense work will substantially offset reduced employment in other departments resulting from curtailment of the washer business," Fred Maytag, president of the firm, said.

Government curtailment of washing machine production has already resulted in the laying off of some employes. The firm recently shut down a part of its plant temporarily due to its inability to obtain aluminum and other materials.

Strauss Electric Closes Due To Steel Shortage

WAUKESHA, Wis.—The Strauss Electric Co. here, maker of electric heaters, has suspended operations for the duration of the emergency due to a shortage of steel, according to E. B. Shurts, general manager.

The Strauss company was organized in Milwaukee in 1925 by Norbert F. Strauss. It was made an affiliate of the Universal Milking Machine Co. in 1931 and moved to Waukesha. The company's 12 employes are expected to be absorbed by the Universal Milking Machine Co.

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A NEW, improved gasket for all refrigerator purposes

This is a NEW gasket of remarkably improved quality which has already won the enthusiastic endorsement of the refrigeration industry. As shown in the illustration above, the flange of this gasket is a fabric which has been woven tightly around a mesh of spring-wire. The flange and wire are both molded firmly into a cushion of resilient, live-sponge rubber, holding it rigidly in position throughout its life. This gasket is very easy to handle and attach. Fits snugly into corners and around curves.

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By DOLE

1 DOLE is the original manufacturer of plate-type evaporators.

2 DOLE is the largest manufacturer of plate-type evaporators.

3 No plate evaporator is more efficient than DOLE—regardless of extravagant claims.

4 DOLE, leadership is the result of high craftsmanship standards and a definite, conservative policy that all claims must be based on fact.

5 DOLE, the pioneer, built on facts and facts have made DOLE the leader in plate-type evaporators that are dependable and priced fairly.

6 Thousands of satisfied users make up a large percentage of the present day DOLE business. DOLE users are satisfied customers.

7 DOLE owns basic patents covering the securing of heat transfer contact with the outer jacket by means of a vacuum. Any other make of plate using a vacuum for this purpose is an infringement on DOLE patents.

8 DOLE Vacuum Cold Plates are sold on merit, not on price.

9 Approved by leading refrigerating equipment manufacturers.

10 DOLE Vacuum Cold Plates are the World's Best Plate Evaporators.

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Like All Pioneers, Household Refrigeration's Pioneers Saw Some Pretty Rough Times

Intimate Highlights on the Formative Period Between 1912 and the First High Production Year—1926

By 1912, domestic refrigeration had entered the stage of commercial practicality. When Woodrow Wilson became president of the United States, the domestic refrigerator was more at home in the inventor's workshop than in the factory. By the time Wilson accepted the office for his second term, production lines bearing domestic refrigerators were beginning to whir.

In 1912, Fred W. Wolf, who claims to be the only man to make any money out of electric refrigeration, invented a sulphur dioxide system that is considered by many to be the grand daddy of the electric refrigerator. To develop a compressor for his device, Wolf called upon inventive Fred J. Heideman, who was then working for the Utility Compressor Co. of Detroit.

DOMELRE MACHINE

Together they produced at Chicago the Domelre machine whose name was abstracted from the first letters of the words "domestic electric refrigeration." As described in a 1914 issue of "Ice & Refrigeration," the compressor, condenser, and motor were mounted on a base over a foot square hole in the top of the refrigerator.

The motor, of ⅓-hp. capacity, operated on either direct or alternating current. It consumed about 260 watts per hour.

Through his "paper" company, the Mechanical Refrigeration Co., Wolf continued to develop his machine until 1916. In 1913 he applied for a patent on it and received one three years later.

During that time, Henry B. Joy had become interested in the device. Joy bought the patent in 1916 and moved all machines, dies, jigs, equipment, fixtures, and tools of the Mechanical Refrigeration Co. to Detroit. There he formed the Isko Co. which continued to develop and market the machine under the name of Isko for several years.

WILLIAMS GETS STARTED

While Wolf and Heideman were nursing their pet along, several utility executives in New York visioned electrical appliances as load builders and urged inventor E. T. Williams to make a domestic refrigerating machine for them.

Taking to the idea, Williams devised a self-contained water-cooled machine in 1914 which he displayed at the Electrical Exposition in New York City that year.

Williams says his machine was "of the rotary compressor type, using ethyl chloride as a refrigerant and glycerine as a lubricant. At 1,800 r.p.m. the machine developed about 600 lbs. of refrigeration. The system was of the dry type and the evaporator was partly submerged in the brine tank.

START OF KELVINATOR

Early in the same year, Edmund J. Copeland ran into a thin, nervous young fellow named Nathaniel B. Wales in Saginaw, Mich. Wales was an inventor. Ever since he had been graduated from the Massachusetts Institute of Technology he had aspired to perfect a household electric refrigerating machine.

After a few talks with Wales, Copeland fell in love with the electric refrigeration idea. Seeing that the only thing needed was capital, Copeland bundled his inventive friend with his rolls of blue prints on the train for Detroit. The two went to see Arnold H. Goss, director of the Chevrolet Motor Co. Copeland had previously worked with Goss at the Buick Motor Car Co. Goss, at that time, was W. C. Durant's confidential negotiator in the organization of the General Motors Corp. (Goss says this meeting took place in 1913, Copeland says 1914.)

Goss found Wales to be "more full of ideas than a pin cushion full of pins." The trio held long discussions over Wales' absorption machine. Convinced of its practicality, Goss authorized him to build a model compressor, providing the expenditures did not exceed a certain sum. Wales went to work in a little second-story shop on Franklin St., Detroit.

MACHINE FOR HOME USE

A few months later, Goss received a call to come over and look at the completed machine. Goss came and looked. Looking like a Rube Goldberg device the machine was a huge mass of tubes, wires, and heavy parts.

"Don't even bother starting the thing up," Goss told the crestfallen Wales.

To Wales' query of why, Goss replied, "I'm interested in promoting a machine for **home** use, not for a factory or a castle. Besides the unit uses anhydrous ammonia—a highly explosive gas requiring heavy pressure to effect condensation. It's impractical and dangerous."

Wales then remembered a smaller compressor he had designed to discharge cool compressed air into the ice compartment of a refrigerator cabinet. He brought it out and showed it to Goss. Goss told him to go ahead and develop this compressor, but to reduce its size still further and use sulphur dioxide.

TROUBLE WITH CONTROL

In perfecting their machine, the main problem the trio encountered was the development of a thermostatic control to make the machine automatic in operation. At a cost of $150,000, they worked out a diaphragm-type thermostat which actuated a switch by contraction and expansion, according to the relative temperature of the air inside the cabinet.

By September, 1914, the sulphur dioxide machine christened Kelvinator was ready for production. Goss and Copeland formed a co-partnership for that purpose. The new company, with Goss as president, was named the Kelvinator Co.

NAMING THE KELVINATOR

The story behind the name is told by Copeland:

"While I was working on the development of the machine, a man by the name of Kemphert, who was then editor of "Popular Science Monthly," often called on me because he was interested in the development from a mechanical and editorial standpoint.

"After the machine had been developed to the point where it was a success, Kemphert got in touch with Stanley Resor of the J. Walter Thompson Co., New York advertising agency.

"Resor coined the words Kelvinator, Kelvination, Kelvinating, to be used in place of refrigerator, refrigeration, refrigerating. Kelvin, himself, had done little experimentation with refrigeration, but his name was taken more or less arbitrarily because up to the time of his death in 1907, he was recognized as one of the world's foremost authorities on thermodynamics.

"A line cut of Lord Kelvin was used on the letterhead of the company, and Kemphert and Resor created a slogan to appear on the literature and stationery."

During the next few years, mechanical progress on the machine stalled. No units were offered for sale during those years.

ORGANIZATION CHANGES

Changes in the organization were plentiful, however. In 1915, two important additions were made to the company in the persons of Fred J. Heideman and Fred Kolbe. Heideman, after analyzing the Kelvinator machine, discarded as unfit most of the refrigeration parts developed by the company up to that time except the condenser.

Disgusted at the way things were going, Copland gave up all his other activities on May 1, 1916, to assume full responsibility over Kelvinator design and production.

A few days later, Goss and Copeland organized the Electro-Automatic Refrigeration Co., which was incorporated under the laws of Michigan to promote the refrigeration developments that previously had taken place and those that were contemplated.

Copeland was elected president of the new company, Goss vice president, and W. T. Utley, secretary-treasurer. But this title did not last long, for on July 28, 1916, the name Kelvinator Co. was restored.

HEIDEMAN'S FREEZERATOR

About this time, Heideman says he left Kelvinator to design and build his own "Freezerator." The Freezerator received the nod of approval from Smith, Hinchman, and Grylls of Detroit's J. L. Hudson Co. and thereby became the first refrigerating machine placed on the floor of a retail department store.

Heideman also designed and developed the shutoff valves with gauge seal openings which were later used on his 1919 Freezerator.

Though their stories are best known, Williams and the Kelvinator trio were by no means alone in the field. Back in 1913, Westinghouse began to experiment with small refrigerating engines, but failed to produce any commercially.

SULPHUR DIOXIDE PLANT

With so many of the new machines using sulphur dioxide as a refrigerant, the production of liquid sulphur dioxide for commercial purposes became a very attractive proposition. So attractive that in 1915 two companies decided not to pass it up. The famous Eustis twins, E. H. and F. A., sunk capital into the Virginia Smelting Co. plant at West Norfolk, Va. and gave charge of its construction to Charles W. Johnston. Johnston managed the Virginia plant after it was built. The first shipment sent out by Virginia Smelting went to the Westinghouse Electric & Mfg. Co. at East Pittsburgh, Pa.

The other company to produce liquid sulphur dioxide was the Ansul Chemical Co. of Marinette, Wis. F. H. Hood, president of the infant firm, however, was not interested in the refrigeration field then.

15 MODELS IN 3 YEARS

Most marked progress of those years was displayed by the Electro-Automatic Refrigerating Co. (Kelvinator). With the assistance of such men as Joseph N. Hadjisky, Edward R. DeLuiz, James H. Dennedy, and Harry E. Thompson, Copeland's organization ironed out its difficulties with the automatic control and gas leakage. Over 15 models were made in the three years it took to perfect these mechanisms.

"More money, more sleepless nights, were spent on the automatic control than any other one device connected with the service the machine was to perform. After all, we were selling a service. The machine was only incidental to that service," Copeland related.

CONTROL PROBLEMS

In developing the control, he consulted Mr. Herman of the Wilson Co., Newark; men at the General Electric Co., Fort Wayne, Ind.; the Johnston Co., Milwaukee; Minneapolis-Honeywell Co., and the Hoskins Co. of Detroit.

"All these companies and their engineering staffs were familiar with heat control. But I wanted cold control," Copeland continued. "I wanted control of low temperatures within a narrow range. Everyone said, 'Copeland, give us ranges from 150° and up and we are at home.'"

VISIT TO FULTON

As a last resort, Copeland went to Knoxville, Tenn., to spend a week at the Fulton Mfg. Co.

At the end of the week, Fulton boxed up everything they had tried, and said, "Copeland, if there is any glory in your accomplishing what you want, take it home with you and work it out for yourself."

Copeland recalls, "I didn't know what to do, but I did go home, and with the aid of the men about me I got a thermostat that would function at 110 to 120 volts, quick make and break, within the desired range of temperature. I probably spent $125,000 on this alone."

STUFFING BOX SEAL

Fred Kolbe, then a workman in the machine shop was responsible for resolving another difficulty that was puzzling Kelvinator engineers. In 1918 he devised a stuffing box seal for compressors used in retaining gas pressure.

Thus perfected, Kelvinator was ready to enter the market. On Sept. 24, 1917, the Kelvinator Corp. of Delaware was organized to sell it. In February, 1918, Joseph T. Schlacks, who was retired as head of the McCord Mfg. Co. of Detroit, purchased the first Kelvinator.

After the machine had proved a success, Copeland told Schlacks that it was his first one. "If I had known it was the first machine, I don't believe I would have bought it," Schlacks snorted.

30 MACHINES IN YEAR

In its first year on the market, 67 Kelvinators were sold. Many were put in homes of friends on approval. Keeping an attentive eye on the first 30 machines installed in Detroit, Copeland personally

(Continued on Page 35, Column 1)

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SILICA GEL
THE Silver Lining
Behind the clouds that darken the industry's horizon, Davison's Silica Gel remains your silver lining. For with Davison's Silica Gel as your working partner, you can do a better job of keeping America's refrigerators running. Expanded manufacturing facilities assure a dependable source of supply of Silica Gel to meet this urgent need.
Davison's Silica Gel will give you the kind of efficiency that the present emergency demands—greater capacity, instantaneous action, no powdering, acid removal. You will find that, in the end, it's more profitable to use Davison's Silica Gel because your work will be more satisfactory, you'll do it in less time and your customers will give you more business.
The responsibility is yours! Make Davison's Silica Gel your standard drying agent and turn responsibility into profitable business.
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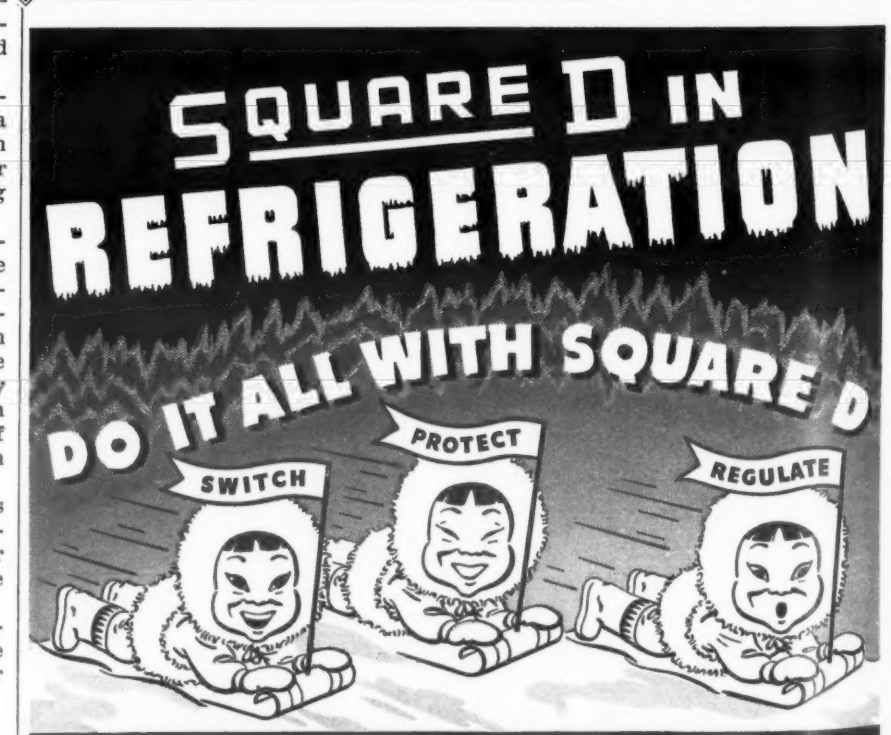

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MANHATTAN V-Belts run smoothly and quietly.
THE MANHATTAN RUBBER MFG. DIVISION
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45 Townsend Street
Passaic, New Jersey

Last War Gave Impetus To Development Work On Mechanical Refrigerators

(Continued from Page 34, Column 5)

answered every service call, no matter what the hour of day or night. It was on these calls, he believes, that he learned what the shortcomings of the machines were, and what the public wanted.

E. T. Williams, during the World War period added two more important inventions to his list of contributions to the electric refrigerator. Both were shaft seals. In the first, a gas tight seal for the compressor shaft, the sylphon members of the bellows were secured to the shaft and revolved with it. In the other, the sylphon member was secured to the machine casing and seal, secured to and revolving with the shaft. They set forth the fundamentals of every motor-driven compressor employing a bellows seal since brought out.

ISKO'S DEVELOPMENT

Another machine that nearly got into the war was the Isko refrigerator. A recounting of its activities during the war period will bring this out. Isko, Inc., organized in 1916 by Henry B. Joy had continued to improve its machine and, in 1918, decided to change from an air-cooled unit to a water-cooled unit to get more satisfactory performance in areas with high atmospheric temperatures.

The name of the organization was also changed from Isko, Inc. to the Isko Co. when Henry B. Joy left to manufacture the Liberty motor. Manufacturing rights to the rotary herringbone gear compressor were purchased from the Leonard Pump & Motor Co. "The pump had many advantages over the compressors previously used, due to the elimination of the valve assembly and the many moving parts necessary with a reciprocating compressor.

FROSTMAKER'S WORK

The first developmental work on this gear type machine was done by the Frostmaker Co. of Chicago, which spent approximately four years perfecting the Frostmaker machine. The Isko Co. designed its first gear type machine for use by the Emergency Fleet, and the Government tests were made at the School for Bakers and Cooks at Camp Meade, Md. Before the tests could be completed, the armistice was signed and the order cancelled.

From these two machines, the Frostmaker and the Emergency Fleet machine, the Model 20 and Model 200 machines were developed and the first ones were put into service in the summer of 1919.

JOY BUYS OUT WOLF

That is the story of Isko as the company records show it. But Fred Heideman, who had worked with both Wolf and Joy, recalls that Joy bought a Domelre machine in 1913 and became so interested that he bought out Wolf in late 1913 or early 1914. Heideman continued on with Joy, who, Heideman says, provided him with real laboratory equipment to work with.

Joy financed the company until early 1915 when he dropped his interest in refrigeration to make the Liberty motor. When Joy left, Heideman says, Isko folded up and he went to Kelvinator to work.

Which of these stories is the true story of Isko is left for the reader to determine. We have tried, but uncertain contemporary records offered us no definite proof that either was wrong.

GUARDIAN AND FRIGIDAIRE

The war had an entirely different effect on the Guardian Refrigerator Co.

Lack of available capital due to military needs put Frigidaire's parent out of business after 50 machines had been placed in the homes of prominent people. Then William C. Durant came along and purchased the company as a personal investment in 1918.

Changing the name of the machine to Frigidaire and the name of the company to the Frigidaire Corp. he promptly sold it to the General Motors Corp. in which he still held a large interest. That was in 1919. Durant named Ben M. Stoddard the first president of the corporation. Stoddard is credited for originating the name Frigidaire.

PRODUCTION HALTED

Frigidaire production lines rolled out a total of 1,000 to 1,200 machines. Then all operations ceased. Users complained that the machines weren't running properly. Because he had placed many of the machines in the homes of wealthy friends, Durant was annoyed and embarrassed.

Durant was a man of action. He called J. Parker B. Fiske, a graduate of the Massachusetts Institute of Technology, to the presidency of the Frigidaire Corp. and ordered the research laboratory of practically every division of General Motors to make tests on the Frigidaire unit to find out what was wrong with it.

WHAT WASN'T WRONG?

In GM's Remy laboratories John R. Replogle and his assistant Frank Wurl were working on a defective Frigidaire. Knowing him from past association, Fiske selected Replogle to take charge of Frigidaire's engineering.

"It was more a case of trying to find what wasn't wrong with the unit, rather than attempting to discover what was wrong," says Replogle.

WILLIAMS OIL-O-MATIC

Durant was generous in his expenditures on research work. In fact, Replogle says he was almost fired because he couldn't spend $1,000,000 a year on engineering research. "If you can't spend that much money," said Durant, "you're not a big enough man for the job."

Needless to say the defects were corrected and the line began rolling again.

Walter Williams of the Williams Oil-O-Matic Heating Corp. was working as far back as 1918 on a household refrigerator that would use methyl chloride as a refrigerant. But the heating business proved more lucrative at the time, so the experiments in refrigeration lagged.

After several years of development by Dr. Lacy and his associates, the R. & H. Chemicals Co. in 1918 was able to produce methyl chloride for commercial use.

R. & H. METHYL CHLORIDE

Marketing of the gas as a refrigerant was withheld by R. & H. Chemicals Co. until reliable data on the physical, chemical, and thermodynamic properties of methyl chloride, together with toxicity data, were secured. By 1919 the company's production facilities, under the supervision of P. J. Carlisle, were expanded sufficiently to warrant commercial sales.

First compressors on the market to use 'Arctic,' as the special refrigeration grade of methyl chloride produced by R. & H. is known, were made by the Zanesville Engineering & Equipment Co., Servel, and Icemaster.

In February, 1919, the Wagner Electric Corp. of St. Louis, Mo., designed, built, and applied its first motor to a household refrigeration unit—a ½-hp. repulsion-start-induction motor. It was an adaptation of the standard Wagner repulsion-start-induction brush-lifting motor. The average motor was expected to withstand approximately 20,000 starts and stops.

FRIGIDAIRE TO DELCO

By 1920, the fundamental principles of domestic electric refrigeration had been pretty well established and developed to a point where an acceptable product could be put on the market and sold. From then until 1926, the more established companies set their engineers to perfecting a smoother running unit. Their sales forces were out creating a market. Internally, they were undergoing changes to gear themselves for large scale production, sales, and finance. Electric refrigeration was beginning to toddle on its own legs.

Following the progress of the older companies during these next six years, we find the Frigidaire Corp. in 1920 being turned over to the Delco-Light Co. of Dayton, Ohio, a subsidiary of General Motors (Replogle says this was in 1921). When R. H. Grant, president of Delco Light got his hands on the Frigidaire machine, he immediately set about reengineering and redesigning it. In this he received the aid of Charles F. Kettering.

After five years of work, Grant left to his successor in office, E. G. Biechler a Frigidaire greatly improved in design and performance. Biechler had been sales manager of Delco Light under Grant. His use of Delco-Light's excellent rural field organization, highly skilled in specialty selling, is reflected in Frigidaire's sales record.

AIR-COOLED MODELS

In 1921, 365 water-cooled Frigidaire compressors were sold, 300 of them in Frigidaire's own self-contained units. Eighty-four of the units went into Frigidaire's first apartment house installation. The machines were set up in Indian Village Manor, Detroit.

Greatly affecting Frigidaire sales was Delco Light's purchase of the assets of the Isko Co. in 1922. Isko, along with Kelvinator had been making air-cooled machines, based on the Fred W. Wolf patent. Delco Light paid $17,000 for this and other patents that were among the assets of Isko Co.

Frigidaire gave its first air-cooled model no special attention. Yet salesmen found over 7,000 customers for it the first year, 1924. During the same year 12,970 water-cooled units were sold.

Popularity of the air-cooled machine mushroomed. During 1925 39,585 units were sold as compared to 22,456 water-cooled units.

Another feather for the cap of the sales department was plucked from the export market. Three Frigidaire

(Continued on Page 38, Column 2)

Gilmer BELTS

Gilmer . . . the oldest firm of rubber-fabric belt specialists . . . has been serving industry since 1903.

The Gilmer plant is working day and night, making belts for national defense industries and for others just as essential . . . the business of preserving fresh foods, for instance. Makers and sellers of refrigeration and air conditioning equipment look to Gilmer for reliable drives on new and installed machines.

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Gilmer's catalog, "America's Belt Bible," lists V-belts for 7800 models of refrigerators, besides air conditioners, pumps, oil burners, stokers and other appliances. Write for a free copy.

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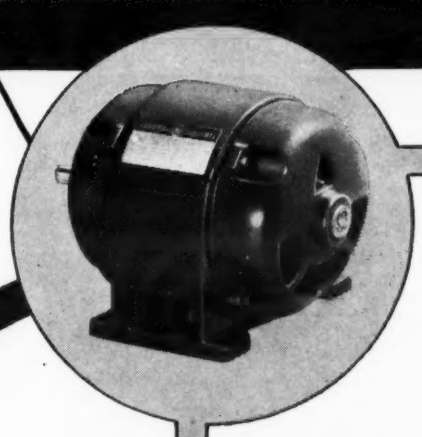
Reduce Maintenance in These Ways

Specify them for air-conditioning and refrigeration equipment. IT PAYS!



THEY ARE QUIET

Capacitor-motors are quiet-starting and quiet-running and are free from brush and commutator noise. Moreover, capacitor-motors do not interfere with radio reception.

THEY HAVE LONG LIFE

Capacitor-motors have an unusually long operating life because of their inherently simple mechanical construction. The cast-aluminum rotor winding is practically indestructible; the stator is resistant to moisture, heat, oil, and mild acids and alkalies; the bearings are large and positively lubricated.

THEY ARE VERSATILE

Capacitor motors meet a wide variety of needs. For normal-starting-torque duty—fans, blowers, etc.—the Type KC is ideal, while the Type KCJ provides the high-starting torque necessary for the proper operation of loaded compressors and similar devices.

AND HERE IS A SPECIAL G-E ADVANTAGE

Surveys show that there is great public acceptance of G-E motors. This means that they will make your selling job easier. G-E motors are another indication that your units are of high quality. Why not cash in on this fact? Specify G-E motors today.

Here's How CAPACITOR-MOTORS SAVE

1. They give reliable service because they are simple, both mechanically and electrically; they have no brushes that might stick or become worn and thus cause starting troubles.

2. They require little servicing because they have no commutator that might become dirty or rough and cause trouble and noise.

3. They have only four electrical parts: a cast-aluminum rotor winding, a dependable stator, a long-lived, centrifugally operated switch, and a compact, reliable capacitor. There is no possibility of commutation trouble because there are no brushes or commutator.

A COMPLETE LINE OF CAPACITOR-MOTORS FROM ⅛- to 5-hp (3600-rpm) FOR REFRIGERATION AND AIR-CONDITIONING EQUIPMENT

GENERAL ELECTRIC

York Corp. Orders Show 40% Gain Over '40

YORK, Pa.—An increase of 39.5% over 1940 in orders booked for the first three quarters of the current fiscal year is reported by York Ice Machinery Corp. Booked orders total $17,529,352.

Orders billed for the same period total $12,784,963, an increase of 20% over 1940. If the improvement in billings over last year continues at the present rate, total orders billed will reach $19,000,000 by the close of the fiscal year on Sept. 30, the company reports. This would compare with slightly more than $16,000,000 last year.

Net income, before Federal and State taxes, exceeds that of June 30, 1940, by $603,000. Unbilled orders as of June 30 approximated $7,700,000, compared to $4,400,000 on the same date last year.

Percentage of business of the firm related directly to the defense program is constantly increasing, it is reported.

Mineral Wool Slab May Be Substitute Of Armstrong Cork

LANCASTER, Pa. — Armstrong Cork Co. is completing plans for the manufacture of a mineral wool type insulating board to replace corkboard for cold storage insulating purposes, it has been announced by H. W. Prentis, Jr., company president.

The change is being made because of government priorities on cork, Mr. Prentis said. Crude rubber and synthetic rubbers are also included in the industry-wide mandatory priority control by the OPM.

"The prospect for business continues to be dominated by the magnitude of the national armament program," Mr. Prentis said. "In view of the enormous sums being spent by the government for both defense and non-defense alike, it appears that the national income will maintain its present upward course. Accompanying that trend a sharp advance in prices appears very likely. Such an eventuality may cause severe economic disturbances; hence the greater importance of checking all inflationary influences by price and wage control legislation, and by limitation of purchasing power through the application of income taxes to a substantially greater percentage of persons gainfully employed."

Mr. Prentis said the company's newly created munitions division has secured contracts to date for shells and shell casings totaling $4,500,000, while defense subcontracts so far completed and now in process amount to $500,000.

Claude Clarke Opens Store In Woodville

WOODVILLE, Miss. — Woodville General Electric Store has been opened here with Claude H. Clarke as manager to handle the full G-E appliance line and small appliances. Salad bowls were given away on opening day to visiting women.

Repair and Replacement Parts Are Now an Independent Phase Of Refrigeration Field

Most Production Is By Original Equipment Manufacturers, But Distribution Introduces New Factors . . . Notably Jobbers and Service Operators

THOUGH the manufacture, sale, and installation of parts for replacement or repair is in some ways an adjunct to each branch of the refrigeration and air conditioning industry, such an enormous amount of business is done in this field each year that it deserves separate consideration.

Naturally, the manufacturers of original equipment are ready to supply parts for replacement or repair through their distributor dealer set-ups, factory branches, or such independent channels as the jobber and independent service man offer.

In addition, there are the manufacturers of "just as good" parts who sell direct to jobbers and service men.

A key figure in the replacement market is the jobber, though his services are not reckoned with by some of the largest organizations. He handles many lines of equipment, sells mostly to dealers and service companies, and has a small business with local assembling companies. In his store, service men discuss the merits of various products, listen to the proprietor's recommendations, and hear trade gossip. The jobber is the industry's equivalent of the old "country store," and many jobbers themselves have acquired reputations as "cracker-barrel" philosophers. About 230 jobbers wholesale 75% of the replacement parts.

Parts Sales for 1941*

1. **REPLACEMENT PARTS** — $23,376,000
2. **INSTALLATION PARTS** — 7,782,000
   Wholesale supply jobbers sold close to 75% of this dollar volume to 52,000 companies engaged in repairing, installing, and maintaining refrigeration and air conditioning equipment.
3. **NORMAL JOBBER INVENTORY INVESTMENT** — $ 3,777,000

*From survey by Air Conditioning & Refrigeration News, July 10, 1941

Like some other factors in the industry, jobbers are difficult to describe as an entity. They range from $2,500 investments to the few who have office buildings and branches.

Most jobbers are content to sell parts and supplies. Others may repair, do shop work on worn parts, or mill parts for customers' jobs. And a few, in possession of a shop and craftsmen, may actually work in the service business, fulfilling a combination wholesale and retail operation.

Total normal inventory investment approaches $4,000,000 annually. Good jobbers have a turnover averaging 5.1 times a year.

Though the flow of replacement goods may short-cut the jobber 25% of the time (moving through manufacturers' factory branches or distributors) he is a pivotal point in this branch of the industry.

Many jobbers started in business as hardware or auto parts wholesalers and retailers. Begged to carry refrigeration parts by some old customers who had become refrigeration service men, they sooner or later found themselves well into a new business.

One by one, parts manufacturers asked them to carry their lines. They did, and business grew with the years, for naturally more and more original equipment needed fixing. The service man was in favor of the jobber's shop, which enabled him to buy all of his parts in one place. The jobber proceeded to fill his shelves by appealing to manufacturers outside the industry to build "just as good" parts.

Today, some of those substitutes have achieved strong competitive positions, and they are penetrating the production centers on equal footing with the older manufacturers of original parts.

The jobbers' customers, estimated at 52,000 companies and individuals, are a good cross-section of the replacement market. Though the bulk of their volume consists of parts for commercial equipment, many commercial refrigeration service men also buy for household and air conditioning replacement.

Independent service men are not so numerous as they were at one time. Much household equipment is repaired by "authorized" firms—under contract to dealers and distributors, or part of a dealers organization. More and more the bigger dealers and distributors are establishing their own service shops. And today's enormous demand for skilled mechanics is draining the industry of its "lone wolf" service men—those who set up shop in their own homes during the depression years.

Other customers are the household rebuilding plants which put back in guaranteed condition about half of the refrigerator trade-ins (which figure is more than 20% of sales). Important replacement parts customers are the big packing plants and dairies. Sixty-six per cent of their parts purchases are for replacement of worn-out equipment.

Fear 60% of Small Business Men May Fail Unless Aided

CHICAGO — A recent survey among the membership of the National Small Business Men's Association, extending into 42 states, has disclosed that unless defense orders or material for regular production can be obtained at once, more than 60% of the manufacturing plants covered by the survey will be forced to shut down, throwing several hundred thousand men and women out of work.

In a recent reorganization of the association, DeWitt H. Emery has resigned as president to become a member of the firm of Pratt & Emery, which will handle the association's public relations and supervise a nation-wide drive to solidify the ranks of small business men.

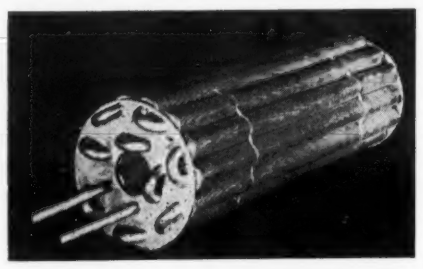
Monroe Shakespeare, president of the Shakespeare Fishing Tackle Co., of Kalamazoo, Mich., was elected to succeed Mr. Emery as president. Walter Gregory, of Chicago, and Russell Stover, of Kansas City, have been named new members of the board of directors.

Expressing the opinion that "under the existing system of priorities small business is in grave danger of being wiped out," Mr. Shakespeare declared that the association would "get the facts and then take whatever action may be necessary to see that small business is not forced to make unwarranted sacrifices."

Bowe To Lead Clinic of Industrial Advertisers

TORONTO, Ont.—Walter A. Bowe, advertising and public relations manager of Carrier Corp., Syracuse, N. Y., will conduct a clinic on "Motion Pictures and other Visual Aids to Selling" during the conference of National Industrial Advertisers Association here Sept. 17 to 19.

No Joints! No Leaks



This Rome Jointless Water Cooled Condenser is a typical example of Rome's ability to provide trouble free condensing equipment. Rome Water Cooled Condensers are used by many leading compressor manufacturers. Write for complete information.

ROME-TURNEY RADIATOR COMPANY
222 Canal Street
ROME, N. Y.

"STORAGE" that Meets All 4 Requirements
1-Necessary Capacity
2-Low First Cost
3-Low Cost Operation
4-Very Low Installation Expense

Install Rō-Way Sectional Coolers for Storage of Vegetables, Fruits, Meats and Beverages

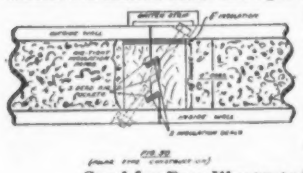
Ro-Way "Walk-In" Sectional Coolers *pay you a good profit* and give your customers efficient and economical storage. Suitable for electrical or mechanical refrigeration. Offer maximum capacity with a minimum of investment and operating cost.

Ceilings, floors and walls are 5⅛ or 5½" thick and consist of inside and outside layers of tongued and grooved yellow Douglas Fir, lined with heavy insulating paper and filled with moisture treated Granulated Cork. Overlapping type doors are insulated same as walls. Door hardware is cadmium plated.

2 TYPES
"Cub" Type for low headroom basements
"Polar" Type in several heights for general use

"Polar" Type has ⅜" thicker ceiling, floor and walls with ⅜" thicker insulation of Granulated Cork. Both Types are made in complete sections, which may be easily and quickly bolted together.

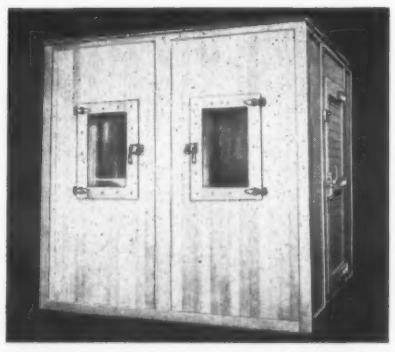
Each section is plainly marked with number corresponding to diagram furnished with each cooler. No skilled labor is required.



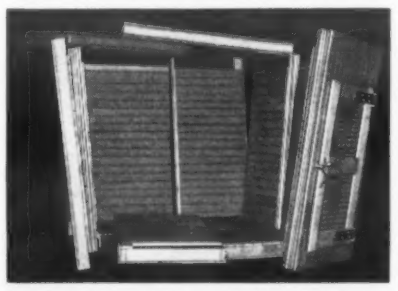
● Note how double-interlocking, double-insulated joints with 2 insulation seals make an airtight seal where sections are connected.

Send for Free Illustrated Folder

ROWE MANUFACTURING CO.
2019 Adams Street • Galesburg, Ill., U. S. A.



Ro-Way "Polar" Type Sectional Cooler with "Walk-In" Door and 2 "Reach-In" Windows.



Easily Taken Through Small Doors —Quickly Set Up

No Section is more than 4 ft. wide for easy passage through small doorways, and inaccessible places. All Sections numbered and easily bolted together.

Mail This Coupon for Illustrated Folder of
Rō-Way
"WALK-IN" COOLERS

ROWE MANUFACTURING CO.,
2019 Adams St., Galesburg, Ill.
Gentlemen: Without obligation, send me Illustrated Folder of Ro-Way "Walk-In" Coolers.
Name.....
Address.....
City.....State.....

Anaconda Copper Refrigeration Tubes
Coils unroll surprisingly straight

THE AMERICAN BRASS CO.
FRENCH SMALL TUBE BRANCH
General Offices: Waterbury, Conn.

There's no substitute for **THE REAL THING**

● When you specify Miller rubber replacement door gaskets, you're not using substitutes—you have the Real Thing! For Millers are original equipment on practically all refrigerators built today. And the replacement line is identical in every respect to the original.

Miller pioneered in the development of rubber door gaskets in the early days of the industry. As a result, 80% of all refrigerators in use today can be serviced, and *serviced properly,* with Millers.

Why use makeshifts when you can get the Real Thing.

MILLER RUBBER COMPANY, INC.
AKRON, OHIO

"Engineers in Rubber"

THIS INDUSTRY

THIS INSTITUTION

EVERY human venture of lasting value to mankind must embody in its pursuit certain fundamental ideals. Foremost are fairness and a love of truth, for without these we cannot merit the esteem and trust of our fellow men.

TO those who publish the printed word, diligent adherence to these ideals becomes a solemn duty. Keeper of the public conscience, the press should continually present the "truth which makes men free."

FAIR play, this love of truth, the firm resolve that the refrigeration and air conditioning industry shall know itself, a zeal to give subscribers more than full measure for their dollars—these are the forces which have motivated this industry's newspaper during its decade and a half of service.

INTO each issue of the NEWS have gone accuracy, completeness, an independence of thought and action. To the NEWS has come, in response, a full share of trust and respect from those who mould the destiny of this industry—the producers, the salesmen and engineers, the men who install and maintain its products.

SHARING the industry's growth, its ups and downs, its fights, the NEWS has become an industry institution.

TODAY we look back on 15 years—years that have seen the rise of this industry (as well as this paper) from obscurity to prominence. In these years the NEWS has gained approval, grown strong, become the industry's spokesman. In the fore of those things which have made its voice heard, its opinions respected, have been the industry's acceptance of its sincerity—plus recognition of the sound underlying ideals and policies which govern its publishing practices.

CRITICAL times are upon us. We are all buffeted by forces beyond our control. Perhaps never before has the NEWS had so rich an opportunity to serve its industry by keeping it informed. We greet that opportunity with the eagerness of youth, tempered with full consciousness of the responsibility implied.

A reporter types in a hotel room. An editor interprets his notes on the night train from Washington. A proofreader scans copy. A linotype operator crystallizes into hard type the sense-making reports they have wrought from the confused picture of an industry caught in the swirl of war. Next week their efforts will be in print, recording word by word truthfully, fairly, independently the living chronicle of this industry. The paper you read will be a symbol of their confidence in, and dedication to, the future of this industry.

Air Conditioning & REFRIGERATION NEWS

AN INTERNATIONAL INSTITUTION — SUBSCRIBERS ALL OVER THE WORLD

CLASSIFIED ADVERTISING

RATES for "Positions Wanted," 5¢ per word; minimum charge, $2.50. Three consecutive insertions, 12½¢ per word; minimum charge $6.25.

RATES for all other classifications, 10¢ per word, minimum charge, $5.00 per insertion. Three consecutive insertions, 25¢ per word, minimum charge, $12.50.

ADVERTISEMENTS set in usual classified style. Box addresses count as five words, other addresses by actual word count.

POSITIONS AVAILABLE

OPERATING EXECUTIVE: Nationwide mercantile organization offers several positions paying up to $3,500 and others to $6,000. Requires executive ability and actual managerial experience in the handling of men and supervising the movement, warehousing, receiving, packing and shipping of quantities of merchandise in large industrial or mercantile companies. Age 28 to 35. College education preferred. Apply only if qualified. Write fully regarding age, education, nationality, marital status, detailed work history including exact salary on each job and number of employees supervised. Please attach small photo. You may list your present employer as replies will be held in strict confidence. Box 1353, Air Conditioning & Refrigeration News.

FRANCHISES AVAILABLE

CASH IN on the General Refrigerator's new line of Display Cases, Reach-In Cabinets, Walk-In Coolers, Beer Pre-Coolers, Bottled Beer Display Cases and Produce Refrigerators. Prices lowest in the industry comparing equal quality and specifications. Manufacturing for almost half a century high quality commercial refrigerators. Write for catalog. GENERAL REFRIGERATOR & STORE FIXTURE CO., 519-21-23 Bainbridge St., Philadelphia, Pa.

DIRECT FACTORY Connection: Sell Refrigerator Display Cases, Walk-In Coolers, Reach-In Refrigerators, Refrigerating Units to Meat Markets, Grocers, Taverns, etc. Financing arrangements to help sell. Write for full information or see EHRLICH REFRIGERATOR MFG. CO., St. Joseph, Mo., Dept. A.

EQUIPMENT FOR SALE

SURPLUS STOCK: Brand new Westinghouse low-sides, complete with coils, valves, fans, manual controls, etc. One to two ton capacity. AC Models $32.50 each; DC models easily converted to AC $18.50 each. ½" Mueller strainers with ½" to ⅜" flare nuts 60¢ each in lots of 5. Complete stock "as is" or rebuilt commercial units. Three fan Frigidaire blower suitable for use on 3 HP condensing unit, ideal for beer cooler. "As is" and rebuilt refrigerators. Write for prices. ASSOCIATED REFRIGERATOR PLANT, INC., 3028 W. Hunting Park Ave., Philadelphia, Pa.

PATENTS

HAVE YOUR patent work done by a specialist. I have had more than 25 years' experience in refrigeration engineering. Prompt searches and reports. Reasonable fees. H. R. VAN DEVENTER (ASRE), Patent Attorney, 342 Madison Avenue, New York City.

STANGARD
Prime Surface
Cold plates

FOR MAXIMUM EFFICIENT REFRIGERATION

Specialists in the Manufacture of all types of COLD PLATES

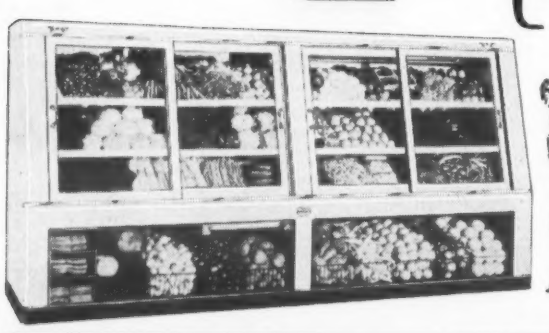
Representatives: A few select territories are still open. Write us regarding our unusual proposition.

FOR Locker Plants, Sharp Freezing, Ice Cream Cabinets, Hardening Rooms, Soda Fountains, Storage Rooms, Milk Coolers, Liquid Cooling, Food Counters and other similar uses.

Write us today for complete information and catalogue.

Stangard-Dickerson Corp., 46-76 Oliver St., Newark, N. J.

Sherer 1*st* { FOR VALUE / FOR SALES / FOR PROFIT



• Just as the Vegetaire (*exclusive with Sherer*) builds profits in the produce department, so will it build sales and profits for you. . . . And the Vegetaire is only one item in a complete line of Sherer refrigerator display and storage equipment! Write for franchise details.

Sherer-Gillett Co., MARSHALL, MICH.

THE PERCENTAGE IS IN YOUR FAVOR

with the new

KOCH METERED MIRAFLEX COILS

Only in Koch cases can you get Metered Miraflex Coils. This patented, exclusive system is sensational and astounding! Sensational, because it automatically maintains constant, correct temperatures and 80% to 90% relative humidity. Astounding, because exhaustive tests show it delivers 10% higher humidity with 20% shorter running time of the condensing unit . . . 90% more air circulation with 75% less ice formation on the coils. Miraflex is just one of many reasons why distributors sell Koch. Write for complete details and open territories.

KOCH REFRIGERATORS
NORTH KANSAS CITY, MISSOURI
You'll make money selling KOCH

'Ideas and Money' Pushed Household Refrigeration Ahead In Early 20's

(Concluded from Page 35, Column 5)

representatives were sent to England in 1924. They were the first American refrigerator salesmen to land on those shores. Their mean task was to pioneer electric refrigerators in a country that had hardly heard of ice boxes. Their success can readily be measured by a glance at the role of American machines in the English refrigerator market today.

THE GROWTH OF SERVEL

While the Toledo Coldmaker Co. was enjoying its big boom, James Howard Dennedy was completing the design of what subsequently became the Servel machine, the first successful methyl chloride system. Seaber Johnson, vice president of a washing machine firm, became interested in the machine and organized Seaber Johnson Co. in Detroit to manufacture it. Associated with Johnson in this venture was Carl W. Johnson and Fred E. Hazard, who had led Johnson a fast competitive pace in the washing machine field.

Later in the same year, 1922, the name of the firm was changed to National Electric Products Co. and the plant was moved to Chicago. There W. Morris Tibbett of Sears, Roebuck & Co. joined the business and gave Johnson a valuable contact. Through Tibbett, a contract was made with the Hercules Engine Co. of Evansville, Ind. to manufacture the new machine.

Then the firm name was changed again, this time to Ser-Vel Corp. of Indiana. Soon after, it became Servel Corp. of Delaware. The machine was labelled Servel.

The corporation's first big job was to induce the R. & H. Chemicals Co. to invest in equipment necessary to manufacture methyl chloride. Succeeding in that, the firm was able to and did bring out standard household models yearly.

The Servel machine caught on with the public rapidly. The firm became known as a good thing to men with money to invest. Strong support was gained by the company when E. T. Williams decided to join up. Williams had ceased building his machine in 1924. On a visit to the Good Housekeeping Institute in Detroit that year, Williams first saw the Servel machine. Expressing confidence in its future, Williams urged his New York associates to take on the Servel sales agency for New York City and vicinity.

KELVINATOR SETS PACE

Kelvinator Corp. roared into the 1920's with a production schedule that more than doubled every year. At the opening of the decade, 600 Kelvinators were operating in Detroit and vicinity. Each year saw more added.

Consistent with its early history, Kelvinator's organization remained in a continuous state of flux. Up to 1921, Goss and Copeland had supplied all the capital to run the business. But in that year, Leo, Joe, and Jean Siegel of the American Lady Corset Co. and Siegel's women's store of Detroit; E. P. Hammond of the Gemmer Mfg. Co.; Martin L. Pulcher, Federal Motor Truck Co.; and Arthur J. Mayer of Gregory, Mayer & Thom invested money in the enterprise. A stock issue was floated in 1921 and 1922.

When this change took place, Copeland withdrew from the corporation and Frank Riley came in to spend a year as manager of the cabinet division. At the end of the year Riley left to join the new Servel, Inc.

Just before Kelvinator brought out its first self-contained unit in 1925, the corporation underwent another reorganization and emerged this time as the Kelvinator Corp. of Michigan.

COPELAND BREAKS AWAY

When Copeland left Kelvinator in 1921, he began work on a machine of his own that would use isobutane as a refrigerant. In all other respects it was similar to the Kelvinator. To develop the new refrigerant, Copeland received the assistance of Harry Edwards of Union Carbon & Carbide Corp.

After having developed the machine, Copeland went to Flint, Mich., in April, 1923, broke. There he borrowed money to organize Copeland Products, Inc. Half of the money came from local friends.

The immediate effect of these new interests in the company was the removal of the plant from Flint to Detroit. Established in his new surroundings, Copeland immediately gathered men of recognized ability around him.

He secured George W. Mason, works manager of Chrysler Corp. as vice president and general manager. W. D. McElhinny, formerly of Delco Light, was made vice president in charge of sales. C. W. Hadden, former general sales manager for the Velie Motor Corp. was added to the executive staff.

E. H. Brown, vice president of General Aluminum & Brass Co., was named secretary-treasurer. A. M. Taylor, former advertising manager for Franklin Automobile Co. was secured as manager of advertising and sales promotion.

With these men in key positions, Copeland Products was ready for the sales drive that carried its name to a commanding position in the electric refrigeration field.

OTHERS EYE FIELD

Activities such as those described above made the electric refrigeration field very tempting to men with ideas and money. While Frigidaire, Kelvinator, Copeland, and the others were strengthening their positions other manufacturers jumped into the field to give them a run for their money.

Shortly after the war, L. J. Kimmel perfected his Electro-Kold machine and formed the Electro-Kold Co. with the aid of Spokane, Wash., capitalists.

C. E. L. Lipman of Lipman Refrigerating Car & Mfg. Co., South Beloit, Ill., produced a household refrigerator in 1921 that did not use brine tanks. The evaporator on his refrigerator consisted of cast iron chambers for ice trays. The casting was surrounded by steel coils and the entire unit was hot dipped in zinc.

Lipman later designed small ammonia machines for the General Refrigeration Co. of Beloit, Wis., and had a hand in the design of the Grigsby-Grunow Majestic refrigerator.

ZEROZONE FOUNDED

An enterprising quartet of employes at the Iron Mountain Co., a machine shop on Chicago's 95th St., felt themselves ready in 1922 to market the machine they had spent the war years developing. That quartet, C. E. and S. R. Jernberg, O. H. Anderson, and P. A. Lovegren, formed the Zerozone Corp. and brought out their "Model S" unit of ¼-hp. capacity. It was designed to modernize old ice boxes and to be used on multiple hookups in Chicago's many apartment houses. With the introduction of self-contained units, Seeger, Rex, and Rhinelander cabinets were utilized. In those early days, William E. Bihl, who developed Zerozone's thermostatic control, was chief engineer of the firm, and R. E. Polley headed the service department.

In 1923 Universal Cooler Co. rounded out the list of active competitors.

Complementary to the above work, several auxiliary products were introduced. The Leonard Refrigeration Co. claims the honors for producing the first cabinet designed exclusively for mechanical refrigeration in 1921. Harry W. Bundy, in 1922 founded the Bundy Tubing Co. Bundy had invented the machine used to roll his "Bundyweld" copper lined and steel coated tubing. And, finally in 1925, the first Larkin coil was patented.

LOOKING BEFORE LEAPING

Though not yet ready to enter the field actively, three other refrigeration firms, spent the early 20's carefully working over their models. They were the General Electric Co., the Westinghouse Electric & Mfg. Co., and the Welsbach Co.

As early as 1921, J. J. Wood and Clark Orr of the General Electric Fort Wayne, Ind., plant began making units for the homes of company officials. That machine was dubbed "the Rolls Royce of Refrigeration."

Believing in the motto "look before you leap," G-E sent A. R. Stevenson around the nation interviewing utility men, dealers, inventors, and others who might figure into electric refrigeration—to see how the idea was catching on.

What he found must have been encouraging, for the company turned out about 100 test units shortly afterwards. Then, in 1925, G-E turned its refrigeration problem over to Christian Steenstrup, supervisor of mechanical research at Schenectady. The company decided on the hermetic unit as a means of attaining large-scale sales without servicing worries. Under Mr. Steenstrup's supervision, the "Monitor Top" was developed.

Also interested in hermetically sealed units, Westinghouse Electric & Mfg. Co. did some experimental and developmental work, employing single stage rotary vane compressors and utilizing ethyl chloride as a refrigerant. As a result, the company decided that its machine should have its motor and compressor directly connected and enclosed in a hermetically sealed casing.

From 1921 to 1926 various types of machines were investigated, both open and hermetically sealed, high speed and low speed, rotary and reciprocating compressors.

U. S. GOVERNMENT Specification

Filtrine

Cafeteria Coolers
Filtrine Mfg. Co., Brooklyn

Fulco ADJUSTABLE REFRIGERATOR COVERS

Fit any refrigerator. Excellent quality covering, well padded and reinforced at edges. Reduce loss from damage in transit to a minimum by full equipment with FULCO Adjustable Refrigerator Covers.
FULTON BAG & COTTON MILLS
Manufacturers since 1870
Atlanta St. Louis Dallas New Orleans Minneapolis New York Kansas City, Kan.

BUY ACME COOLING UNITS
JACKSON ACME INDUSTRIES MICH.

GALE CONDENSING UNITS
Precision built for efficient operation.
GALE PRODUCTS
1635 Monmouth Blvd. Galesburg, Ill.

FOR BETTER SATISFIED CUSTOMERS USE—
AIR-MAZE
Permanent Air-Filter Panels
AIR-MAZE CORP. CLEVELAND, OHIO

BUNDY TUBING
ENGINEERED TO YOUR EXPECTATIONS
BUNDY TUBING CO., DETROIT

'Town Meeting' Brings Old Friends Together

In the "relaxing period" following the meeting the News furnished refreshments and those attending got an opportunity to renew acquaintanceships with old friends. Here are Leon Young of Young Supply Co., Detroit supply jobber; H. T. Lange, president, Spoehrer-Lange Co., St. Louis; and G. N. Knowles, Brunner Mfg. Co., Utica, N. Y.

Emergency Repairs Given Rating By OPM, But Further Clarification Is Needed

(Concluded from Page 1, Column 1)

The question immediately comes to mind as to whether retail food stores and restaurants—probably the largest users of commercial refrigeration equipment today—can be classified as "plants refrigerating or storing food for human consumption."

This Preference Rating may be applied only by (1) a "producer" which under Number 8 means the user of refrigerating equipment and (2) a "supplier" of the equipment.

Now under the definitions in the Order P-22 it says:

"Supplier" means any person with whom a purchase order or contract has been placed by a producer or any supplier for

(1) Materials to be used for repairs.

(2) Material required for a producer's emergency inventory.

(3) Material to be physically incorporated in other material which is to be used for repairs or which is required for a producer's emergency inventory.

Since this says that a "supplier" may place an order—with Preference Rating—with a "supplier," it seems capable of being interpreted to mean, for example, that a parts supply jobber, dealer, or service man might place an order with a manufacturer or with some sort of supplier for a necessary repair part.

However, it was stated that in one early interpretation put on the Order by the OPM, it was said that the rating would hold good only on orders for repair parts by users direct from the manufacturer. This hardly seems the intent of the written version of the order.

In a statement which was sent out with the order, OPM officials stated that "special orders may be worked out to meet problems in certain industries." It is also the feeling of refrigeration men close to the situation that liberal interpretations will be given when the problems in the field become evident.

The order permits qualified producers or suppliers to apply a preference rating of A-19 to deliveries of required repair parts by endorsing a special statement on purchase orders, certifying that the material being ordered is for repair work under the terms of the order, P-22.

The order can be used also to get deliveries for "emergency inventory."

Repairs are defined in the order as repairs needed because of an actual or imminent breakdown. Emergency inventory is defined in the order as the minimum inventory of material required to provide for repairs to meet an actual or imminent breakdown.

The present order, declare OPM officials, is designed primarily to protect industry against sudden breakdowns and is regarded as an interim measure. The entire inventory problem, officials state, is to be studied further with a view to providing broader priority assistance.

All Preference Ratings Are Made Mandatory

WASHINGTON, D. C.—A new regulation which makes all preference ratings mandatory was issued Sept. 10 by Donald M. Nelson, Director of Priorities.

The new provision is incorporated in Priorities Regulation No. 2, which also:

(1) Declares valid all preference rating certificates being issued during the period of transition over the signature of E. R. Stettinius, Jr., former Director of Priorities, and

(2) Provides specifically for stamping preference rating on application blanks if this is necessary to avoid delays involved in making out complete preference rating certificates. An announcement that this special stamp is being used in such cases was made on Monday.

Mr. Nelson said that the new legal power to make all ratings mandatory will be of great assistance in effecting strict enforcement of all priority rules and regulations. Increased emphasis is to be put on enforcement of orders and compliance by all those affected.

Reasons for the three moves are as follows:

1. Mandatory ratings.

The provision of the regulation making all preference ratings mandatory is of great importance.

Under the original legislation for priorities, incorporated in Section 2 (a), Public 671 (76th Congress, third session) mandatory preference ratings were assigned only for Army and Navy contracts.

Preference ratings issued for civilian contracts, for foreign government contracts, and for other United States governmental contracts were based upon the voluntary cooperation of the persons concerned.

Because of increasing shortages, additional powers were required to deal with the problem. These powers were granted in the "Vinson Bill" (Public 89, 77th Congress, first session) and have now been vested in the Priorities Division.

Under the new powers, all priority actions for defense will be mandatory in nature. This will be of assistance to many producers who, in the past, were sometimes confronted with serious scheduling difficulties as a result of having both mandatory and voluntary ratings on their order books.

2. Ratings signed by former director.

Although Mr. Nelson has succeeded Mr. Stettinius as Director of Priorities, a number of preference rating certificates issued by Mr. Stettinius are still in operation. More, a large number of certificates signed in blank by Mr. Stettinius, for the use of Army and Navy field officers, are still available and are to be used in the field for the time being.

Because of this, it was necessary to declare specifically that, during the period of transition, the certificates issued over the facsimile signature of Mr. Stettinius are valid and continue to be valid.

3. Handling of applications.

During the past several weeks, a number of factors combined to build up a large backlog of applications for preference ratings which it was impossible to process promptly. Lack of space, lack of sufficient personnel, and a marked rise in the number of applications received were all responsible.

In May, preference rating applications were being received at the rate of about 600 a week. Recently this rate had risen to between 4,000 and 5,000 a week. As a result, the number of applications "in process" increased.

The new plan announced by Mr. Nelson will permit the rapid handling of these delayed applications in the following way:

Instead of processing each application as usual, and preparing individual preference rating certificates which require a lot of paper work, a preference rating—if one is to be granted—will be stamped on the face of the application itself.

The blank will then be returned to the applicant, who can use it just as he ordinarily would use a preference rating certificate. The use of this system already has resulted in cleaning up thousands of pending applications during the last several days.

The ruling on this point says:

"Preference ratings may hereafter be validly assigned by the Director of Priorities by means of the following endorsement (or any other form of endorsement prescribed by the Director of Priorities) stamped upon the face of any application for preference rating, including Form PD-1:

"Preference Rating .. is hereby assigned to deliveries of the materials specified in the quantities and on the dates shown in the Schedule.

(sgd) D. M. Nelson
Director of Priorities."

Iowa Governer Warns FDR On Washer Curtailment

DES MOINES, Iowa—In a telegram sent to President Roosevelt and leading defense production officials, Gov. George A. Wilson of Iowa has asserted that proposed curtailment of domestic washing machine production "threatens destruction of several small manufacturers in Iowa."

"These firms have already cooperated in the defense program by the use of substitutes for aluminum, zinc, and other essential items, and further by seeking defense sub-contracts," the telegram said.

"Their youngest and best mechanics already have gone into arsenals and munitions plants. Their remaining employes are largely older men, physically unfit to meet the requirements of defense industries. Unless these small makers of washing machines are spared the proposed curtailment and are permitted to obtain their small needs of material to operate on a reasonable basis, their old employes will have to go on relief, and the dependent communities will suffer economic hardships."

R. D. Hunt, executive vice president of Dexter Co., Fairfield, one of a delegation of washer manufacturers visiting the governor, declared that the proposed production curtailment would necessitate the laying-off of 100 men in his company's plant alone.

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No cracks or splits when flared against a block
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RANCO TYPE G 2
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These Are Some of the Main Ideas For Action

(Concluded from Page 1, Column 5)

Organize campaigns on a state-wide basis, with each state group telling a unified story—importance of refrigeration to public welfare and morale. Enlist the aid of your state's congressmen by petitions from: 1. Workers in the industry itself; 2. Users of refrigeration equipment, household and commercial.

Induce defense heads to "ration" their own materials requirements as they are needed, rather than to place huge orders for supplies, some of which may not be needed for two years or more.

Manufacturers have done a pretty good job of selling their importance to defense heads—now it's time for the wholesalers and retailers to tell their story. It's a story which they must prepare and present themselves—with actual facts and figures as to why their function is essential to the national welfare.

The industry cannot be satisfied with telling its story once—it must be repeated again and again, for the benefit of new men in the defense set-up who haven't heard it before.

Study and adopt the plan employed by some organization or industry which has been successful in telling its story to defense leaders. Then set this same course of action for refrigeration, with all persons affected—household refrigerator users, commercial and air conditioning users, and all branches of the industry itself—working toward this single goal.

Refrigeration Equipment Affected By South African Curb on Imports

NEW YORK CITY—Household refrigerators and refrigerating equipment are affected by import restrictions imposed by the Union of South Africa, effective Sept. 15, under which no goods not already in transit from non-sterling countries will be allowed to enter that country without a permit.

Coincident with the imposition of these restrictions, a ban was issued on a long list of "luxury" articles, including vacuum cleaners and phonographs, the importation of which is halted entirely.

Although not unexpected (South Africa is the last of the British dominions to adopt such a measure), the order caught exporters here unaware and is expected to disrupt, at least temporarily, a trade which has increased almost twofold since the start of the war. Exports to South Africa, exclusive of war goods, totaled $76,966,000 in the first six months of this year, almost as much as for the whole of 1938, last pre-war year; and imports, largely manganese and chrome, hit $22,000,000 also more than double all of 1938.

Belief in business circles was that the primary reason for the restrictions was lack of shipping space, with conservation of dollar exchange a second important influence.

Imposition of the new restrictions will mean a double check on exports. After a "certificate of essentiality" is obtained by the South African importer and the order placed, the goods will be subject to shipping priority as decided by the South African Purchasing Commission, which began functioning here recently.

The "in transit" provision was believed to cover all goods that had left the factory by the time the restrictions went into effect. Several million dollars worth of materials on order would have to await import license for shipment, it was believed.

Ice Cream In the Army

U. S. soldiers consume 3¾ gallons of ice cream a year, which is half again as much as the 2¼ gallons consumed by civilians, "The Ice Cream Trade Journal" was pleased to report last month, after a 30-day survey of the army's ice cream habits.

Meet Sept. 20 On N. Y. Service Plan

(Concluded from Page 1, Column 2)

(1) Inspectors from the utility will inspect the operation of the dealer depots and service stations at regular intervals.

(2) The Consolidated Edison Finance plan will be applied to repair cases, and people would thus be able to have appliances repaired on the instalment plan.

(3) The utility will support the plan through its advertising (mail enclosures, signs on the counters at its regular offices, etc.).

Reactions of the trade to the plan are varied. Certain of the manufacturers are said to be cooperative, the distributors are inclined to be wary, the dealers are somewhat apathetic, and most service men are apparently quite alarmed and ready to fight the plan.

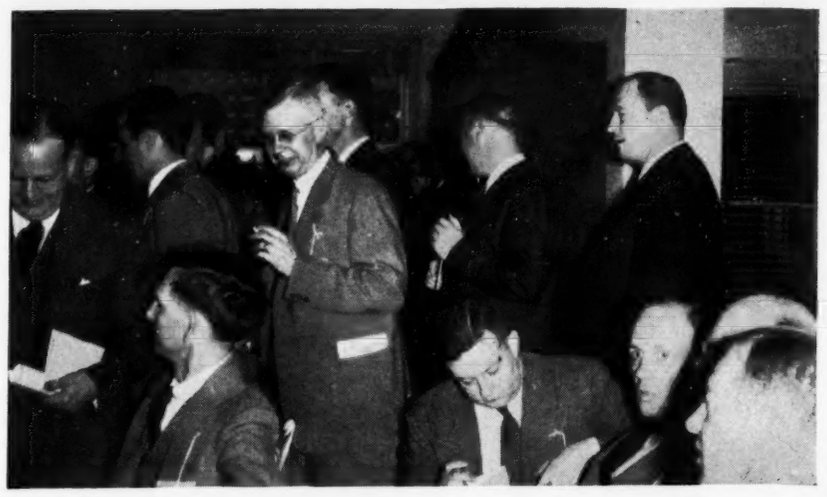
Industry Men Working On 'Standards' Plans

(Concluded from Page 1, Column 3)

at further meetings into a standard known as the "Emergency American Standard" for eventual publication.

This work was instituted by American Standards Association at the request of Miss Harriet Elliott, Associate Administrator of the Office of Price Administration in charge of the Consumer Division, who also has asked A.S.A. to establish specifications for simplification of other consumer goods, including washing machines, irons, etc.

As the 'Town Meeting' Was Adjourned



H. T. McDermott, secretary, Refrigeration Service Engineers Society, compares notes with R. J. Rehwinkel (seated), vice president, McCray Refrigerator Corp. In the background are Lin Kraus, Minneapolis-Honeywell Regulator Co.; A. J. Meyer, Ranco, Inc.; and F. E. "Jerry" Jernberg, Mills Novelty Co.

Refrigeration Tax May Be Applied Oct. 1

WASHINGTON, D. C.—The new tax bill, incorporating a 10% tax on all refrigeration equipment, which is expected to get a final O.K. from Congress this week, will go into effect Oct. 1 if signed by President Roosevelt before the 21st of September.

It is provided in the bill that it become effective the first of the month following passage, unless it was passed less than 10 days before the end of the month.

Since the wording of both the House and Senate versions was exactly the same with respect to the refrigeration tax, there was nothing that the conference committee could do, under the law, to make any change in that portion of the tax bill.

Refrigeration associations who have been active in trying to get the bill changed, are now turning their attention to the administration of the refrigeration section of the bill, which is capable of a considerable amount of interpretation by revenue department officials.

They hope to get an interpretation of the bill early that will prevent a pyramiding of the tax through the suppliers and sales agencies.

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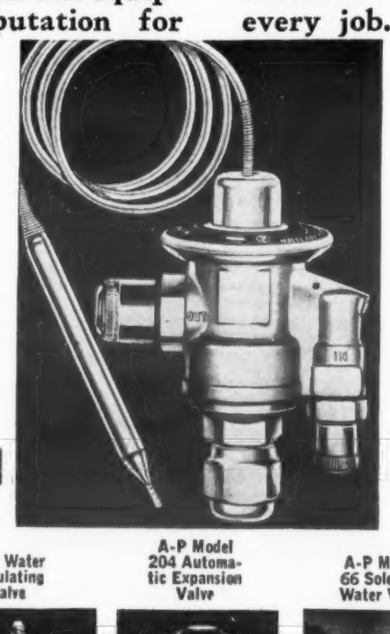
Progressive Service Engineers Use and Recommend — and Aggressive Jobbers Stock and Talk A-P Products.



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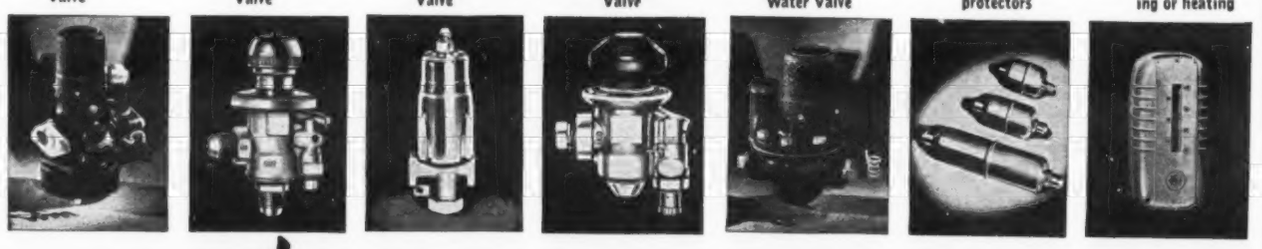

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A-P DEPENDABLE Refrigerant Valves

HOW THE INDUSTRY DIS

Suppliers

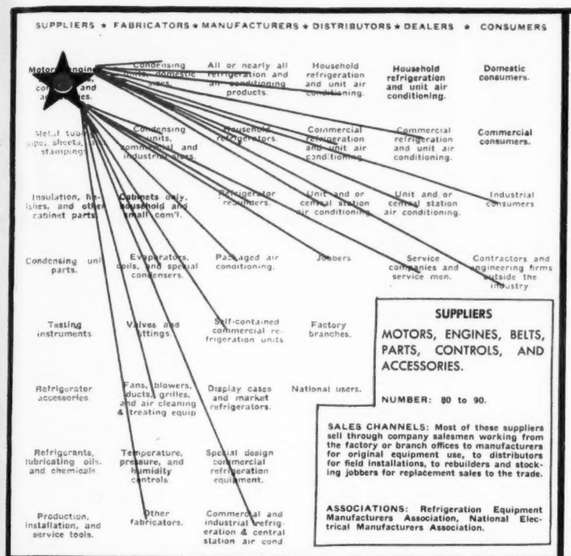
Companies in the column below produce materials and fabricated goods for many industries, of which refrigeration and air conditioning is one. While not all of the production of these types of companies is absorbed by this industry, the goods produced for this market are usually of special construction and specifications.

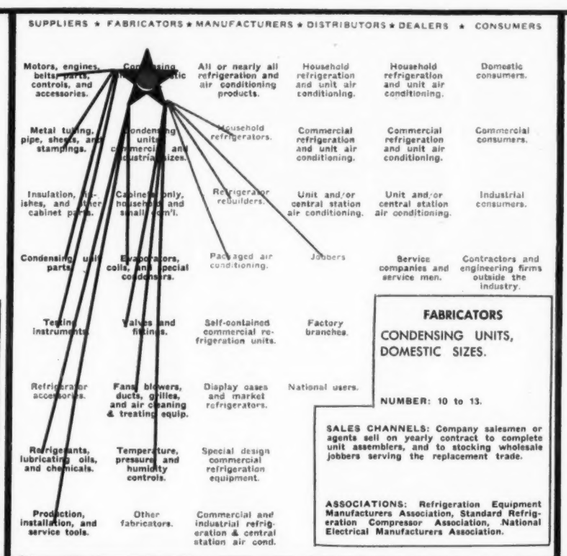
Fabricators

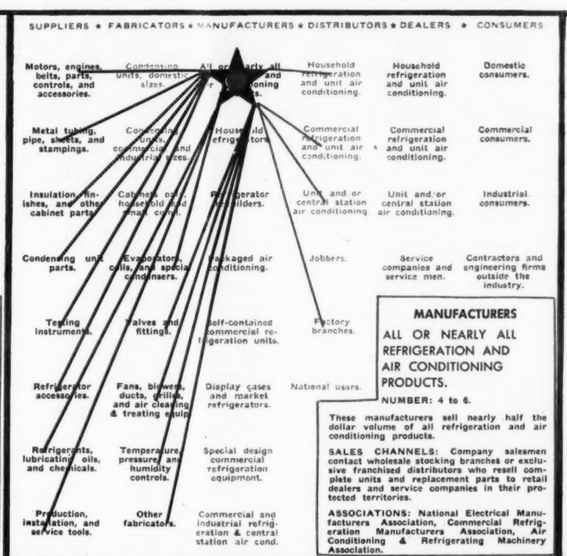
Companies in the column below buy materials and fabricated goods from suppliers, process them further and resell them to complete unit manufacturers, installation and replacement buyers in this industry. These are the parts makers of the industry—most of them sell the bulk of their production to this field.

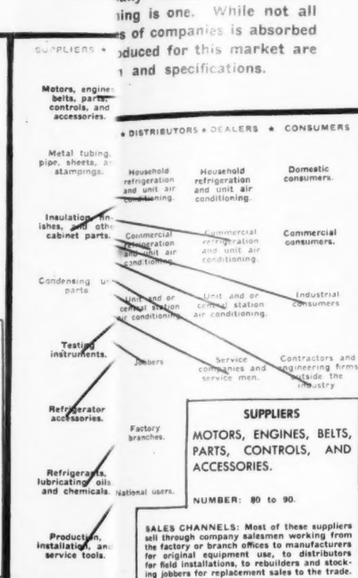
Manufacturers

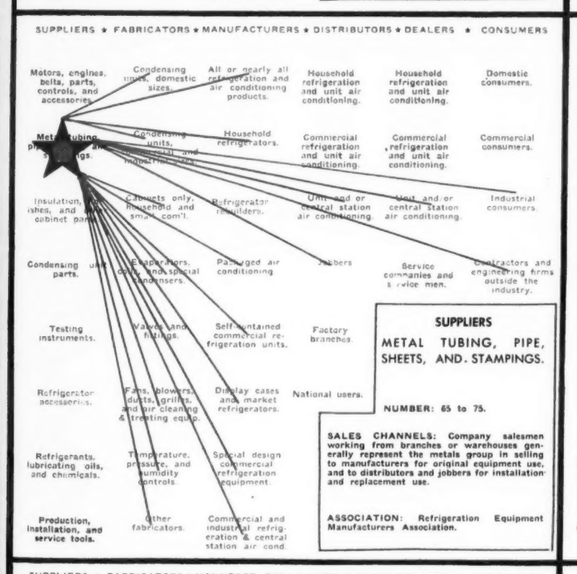
Companies in the column below buy materials and processed goods from suppliers and fabricators, reprocess and assemble them into complete units for resale to distribution, dealer, and consumer groups. Some of them use distributor-dealer channels for resale of fabricator-made replacement parts, others use jobbers.

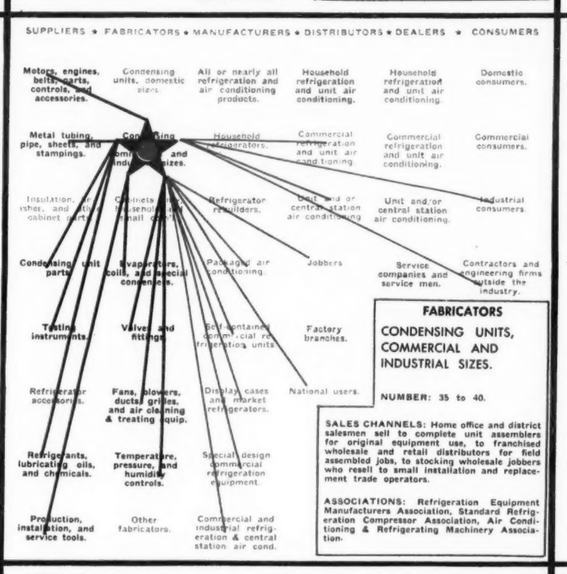

SUPPLIERS ★ FABRICATORS ★ MANUFACTURERS ★ DISTRIBUTORS ★ DEALERS ★ CONSUMERS
SUPPLIERS
MOTORS, ENGINES, BELTS, PARTS, CONTROLS, AND ACCESSORIES.
NUMBER: 80 to 90.
SALES CHANNELS: Most of these suppliers sell through company salesmen working from the factory or branch offices to manufacturers for original equipment use, to distributors for field installations, to rebuilders and stocking jobbers for replacement sales to the trade.
ASSOCIATIONS: Refrigeration Equipment Manufacturers Association, National Electrical Manufacturers Association.

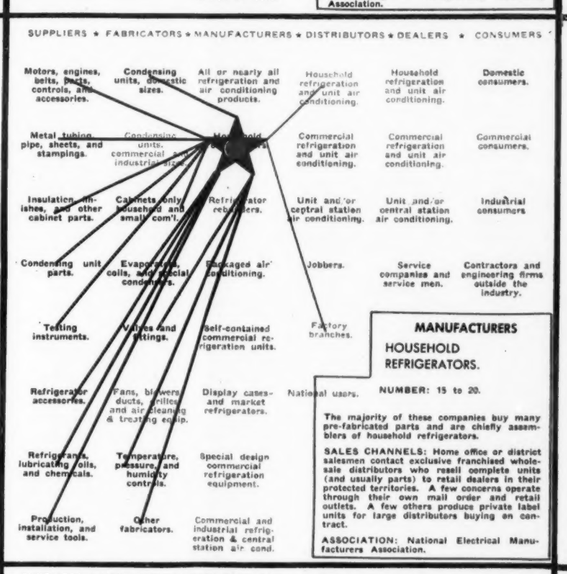

SUPPLIERS ★ FABRICATORS ★ MANUFACTURERS ★ DISTRIBUTORS ★ DEALERS ★ CONSUMERS
FABRICATORS
CONDENSING UNITS, DOMESTIC SIZES.
NUMBER: 10 to 13.
SALES CHANNELS: Company salesmen or agents sell on yearly contract to complete unit assemblers, and to stocking wholesale jobbers serving the replacement trade.
ASSOCIATIONS: Refrigeration Equipment Manufacturers Association, Standard Refrigeration Compressor Association, National Electrical Manufacturers Association.

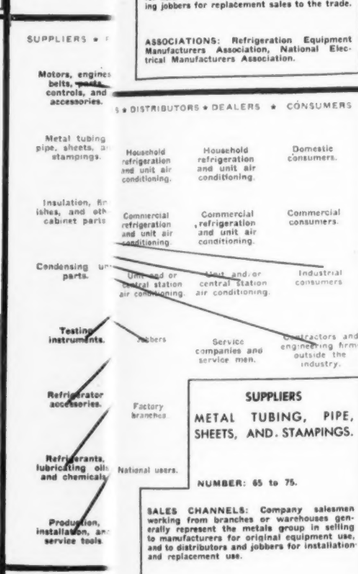

SUPPLIERS ★ FABRICATORS ★ MANUFACTURERS ★ DISTRIBUTORS ★ DEALERS ★ CONSUMERS
MANUFACTURERS
ALL OR NEARLY ALL REFRIGERATION AND AIR CONDITIONING PRODUCTS.
NUMBER: 4 to 6.
These manufacturers sell nearly half the dollar volume of all refrigeration and air conditioning products.
SALES CHANNELS: Company salesmen contact wholesale stocking branches or exclusive franchised distributors who resell complete units and replacement parts to retail dealers and service companies in their protected territories.
ASSOCIATIONS: National Electrical Manufacturers Association, Commercial Refrigeration Manufacturers Association, Air Conditioning & Refrigerating Machinery Association.

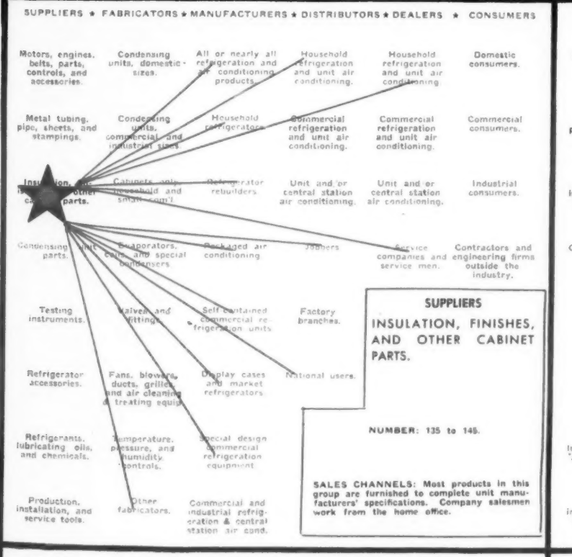


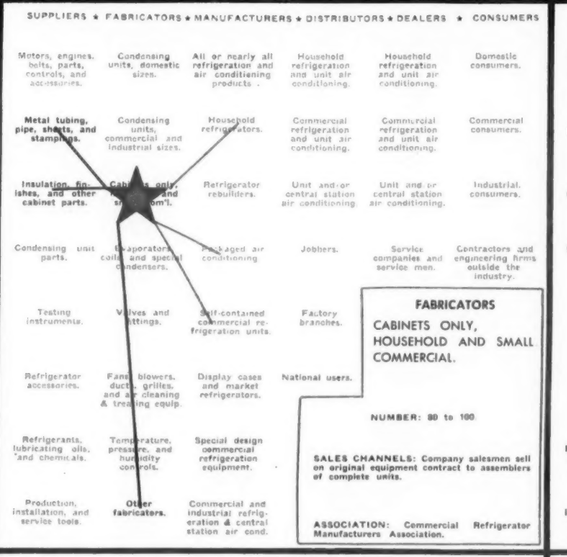

SUPPLIERS ★ FABRICATORS ★ MANUFACTURERS ★ DISTRIBUTORS ★ DEALERS ★ CONSUMERS
SUPPLIERS
METAL TUBING, PIPE, SHEETS, AND STAMPINGS.
NUMBER: 65 to 75.
SALES CHANNELS: Company salesmen working from branches or warehouses generally represent the metals group in selling to manufacturers for original equipment use, and to distributors and jobbers for installation and replacement use.
ASSOCIATION: Refrigeration Equipment Manufacturers Association.

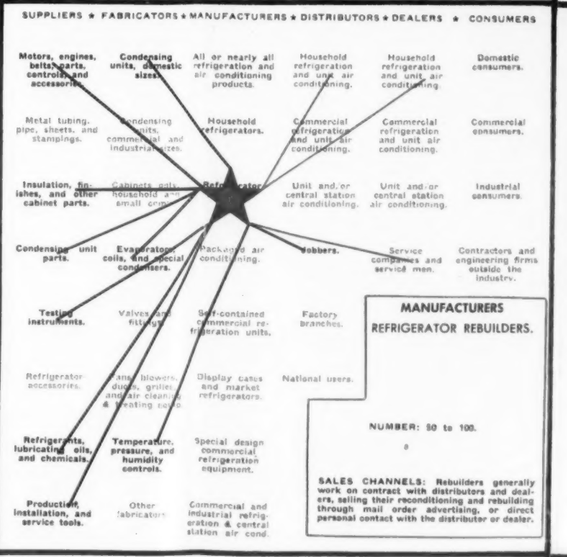

SUPPLIERS ★ FABRICATORS ★ MANUFACTURERS ★ DISTRIBUTORS ★ DEALERS ★ CONSUMERS
FABRICATORS
CONDENSING UNITS, COMMERCIAL AND INDUSTRIAL SIZES.
NUMBER: 35 to 40.
SALES CHANNELS: Home office and district salesmen sell to complete unit assemblers for original equipment use, to franchised wholesale and retail distributors for field assembled jobs, to stocking wholesale jobbers who resell to small installation and replacement trade operators.
ASSOCIATIONS: Refrigeration Equipment Manufacturers Association, Standard Refrigeration Compressor Association, Air Conditioning & Refrigerating Machinery Association.

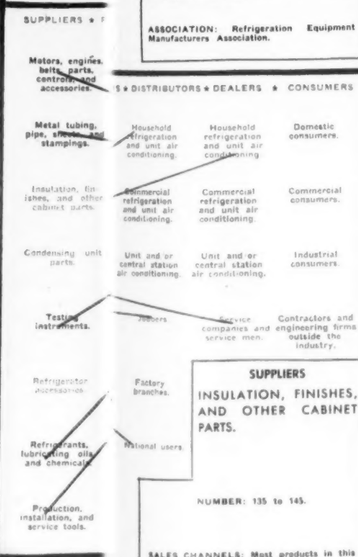

SUPPLIERS ★ FABRICATORS ★ MANUFACTURERS ★ DISTRIBUTORS ★ DEALERS ★ CONSUMERS
MANUFACTURERS
HOUSEHOLD REFRIGERATORS.
NUMBER: 15 to 20.
The majority of these companies buy many pre-fabricated parts and are chiefly assemblers of household refrigerators.
SALES CHANNELS: Home office or district salesmen contact exclusive franchised wholesale distributors who resell complete units (and usually parts) to retail dealers in their protected territories. A few concerns operate through their own mail order and retail outlets. A few others produce private label units for large distributors buying on contract.
ASSOCIATION: National Electrical Manufacturers Association.




SUPPLIERS ★ FABRICATORS ★ MANUFACTURERS ★ DISTRIBUTORS ★ DEALERS ★ CONSUMERS
SUPPLIERS
INSULATION, FINISHES, AND OTHER CABINET PARTS.
NUMBER: 135 to 145.
SALES CHANNELS: Most products in this group are furnished to complete unit manufacturers' specifications. Company salesmen work from the home office.


SUPPLIERS ★ FABRICATORS ★ MANUFACTURERS ★ DISTRIBUTORS ★ DEALERS ★ CONSUMERS
FABRICATORS
CABINETS ONLY, HOUSEHOLD AND SMALL COMMERCIAL.
NUMBER: 80 to 100.
SALES CHANNELS: Company salesmen sell on original equipment contract to assemblers of complete units.
ASSOCIATION: Commercial Refrigerator Manufacturers Association.


SUPPLIERS ★ FABRICATORS ★ MANUFACTURERS ★ DISTRIBUTORS ★ DEALERS ★ CONSUMERS
MANUFACTURERS
REFRIGERATOR REBUILDERS.
NUMBER: 90 to 100.
SALES CHANNELS: Rebuilders generally work on contract with distributors and dealers, selling their reconditioning and rebuilding through mail order advertising, or direct personal contact with the distributor or dealer.



SUPPLIERS ★ FABRICATORS ★ MANUFACTURERS ★ DISTRIBUTORS ★ DEALERS ★ CONSUMERS
SUPPLIERS
CONDENSING UNIT PARTS.
NUMBER: 110 to 125.

SUPPLIERS ★ FABRICATORS ★ MANUFACTURERS ★ DISTRIBUTORS ★ DEALERS ★ CONSUMERS
FABRICATORS
EVAPORATORS, COILS, AND SPECIAL CONDENSERS.

NDUSTRY DISTRIBUTES ITS GOODS

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field.

Manufacturers

Companies in the column below buy materials and processed goods from suppliers and fabricators, reprocess and assemble them into complete units for resale to distribution, dealer, and consumer groups. Some of them use distributor-dealer channels for resale of fabricator-made replacement parts, others use jobbers.

Distributors

This column lists the different types of distributing organizations serving the industry. Broadly speaking, they are the industry's wholesalers of complete units and parts, although complete unit distributors may simultaneously conduct retail operations, particularly in commercial refrigeration and air conditioning markets.

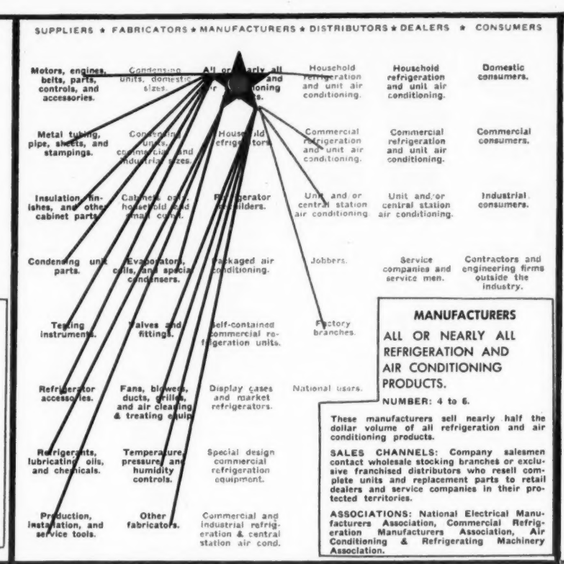
Dealers

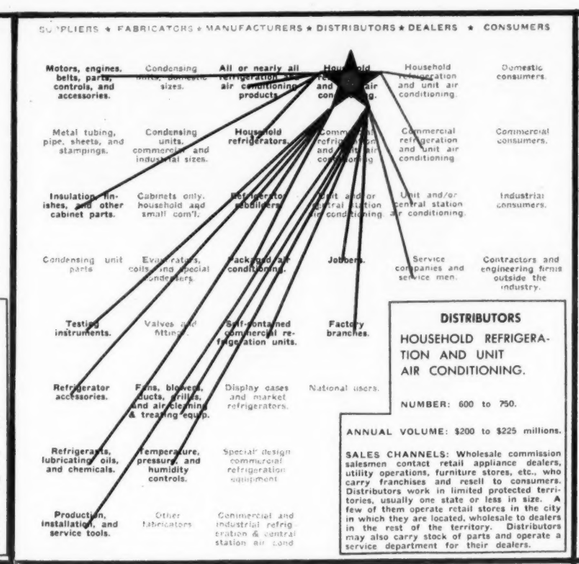
This column represents the industry's retailers of complete units, parts, and service. Chief difference between dealers and distributors who sell to consumers is that dealers do not generally buy direct from manufacturers. Air conditioning dealers often carry no franchise, buy all equipment in the open market.

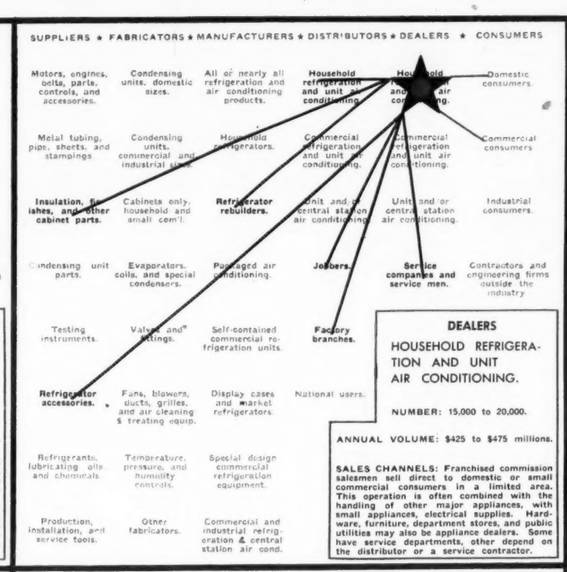
Consumers

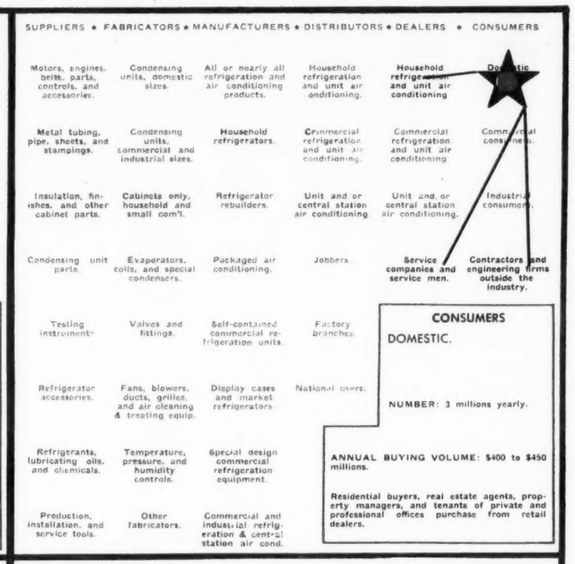
The various types of consumers, or their direct buying agents, are listed in this column. These are the individuals and the companies who put the industry's products to their final uses: preserving food, controlling industrial or biological processes, and creating human comfort conditions.

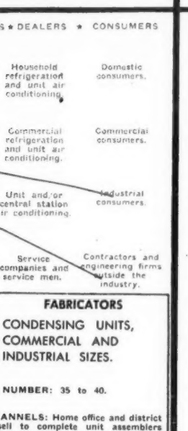
★ DEALERS ★ CONSUMERS
Household refrigeration and unit air conditioning.
Domestic consumers.
Commercial refrigeration and unit air conditioning.
Commercial consumers.
Unit and/or central station air conditioning.
Industrial consumers.
Service companies and service men.
Contractors and engineering firms outside the industry.
FABRICATORS
CONDENSING UNITS, DOMESTIC SIZES.
NUMBER: 10 to 13.
HANNELS: Company salesmen or on yearly contract to complete bblers, and to stocking wholesale rving the replacement trade.
IONS: Refrigeration Equipment rs Association, Standard Refrig- mpressor Association, National Manufacturers Association.

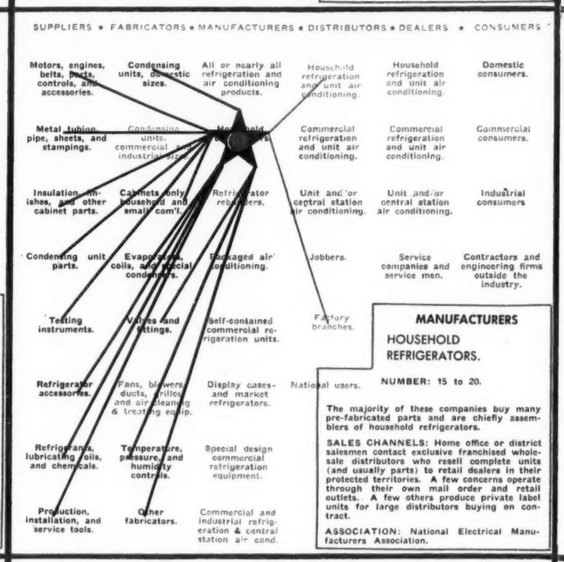

SUPPLIERS ★ FABRICATORS ★ MANUFACTURERS ★ DISTRIBUTORS ★ DEALERS ★ CONSUMERS
Motors, engines, belts, parts, controls, and accessories.
Condensing units, domestic sizes.
All or nearly all refrigeration and air conditioning products.
Household refrigeration and unit air conditioning.
Household refrigeration and unit air conditioning.
Domestic consumers.
Metal tubing, pipe, sheets, and stampings.
Condensing units, commercial and industrial sizes.
Household refrigerators.
Commercial refrigeration and unit air conditioning.
Commercial refrigeration and unit air conditioning.
Commercial consumers.
Insulation, finishes, and other cabinet parts.
Cabinets only, household and small com'l.
Refrigerator rebuilders.
Unit and/or central station air conditioning.
Unit and/or central station air conditioning.
Industrial consumers.
Condensing unit parts.
Evaporators, coils, and special condensers.
Packaged air conditioning.
Jobbers.
Service companies and service men.
Contractors and engineering firms outside the industry.
Testing instruments.
Valves and fittings.
Self-contained commercial refrigeration units.
Factory branches.
Refrigerator accessories.
Fans, blowers, ducts, grilles, and air cleaning & treating equip.
Display cases and market refrigerators.
National users.
Refrigerants, lubricating oils, and chemicals.
Temperature, pressure, and humidity controls.
Special design commercial refrigeration equipment.
Production, installation, and service tools.
Other fabricators.
Commercial and industrial refrigeration & central station air cond.
MANUFACTURERS
ALL OR NEARLY ALL REFRIGERATION AND AIR CONDITIONING PRODUCTS.
NUMBER: 4 to 6.
These manufacturers sell nearly half the dollar volume of all refrigeration and air conditioning products.
SALES CHANNELS: Company salesmen contact wholesale stocking branches or exclusive franchised distributors who resell complete units and replacement parts to retail dealers and service companies in their protected territories.
ASSOCIATIONS: National Electrical Manufacturers Association, Commercial Refrigeration Manufacturers Association, Air Conditioning & Refrigerating Machinery Association.

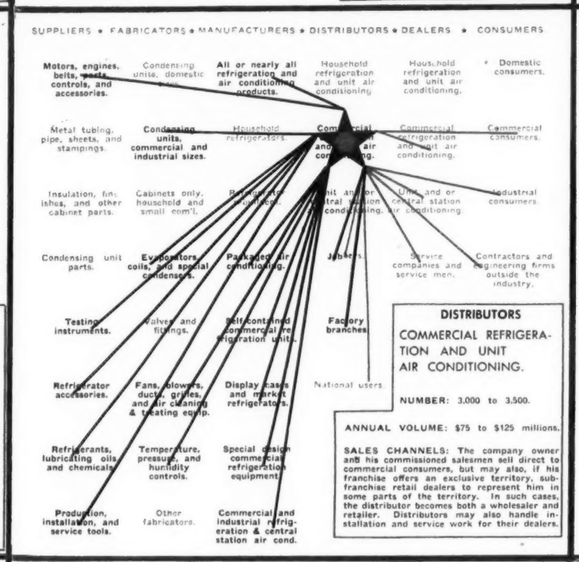

SUPPLIERS ★ FABRICATORS ★ MANUFACTURERS ★ DISTRIBUTORS ★ DEALERS ★ CONSUMERS
Motors, engines, belts, parts, controls, and accessories.
Condensing units, domestic sizes.
All or nearly all refrigeration and air conditioning products.
Household refrigeration and unit air conditioning.
Household refrigeration and unit air conditioning.
Domestic consumers.
Metal tubing, pipe, sheets, and stampings.
Condensing units, commercial and industrial sizes.
Household refrigerators.
Commercial refrigeration and unit air conditioning.
Commercial refrigeration and unit air conditioning.
Commercial consumers.
Insulation, finishes, and other cabinet parts.
Cabinets only, household and small com'l.
Refrigerator rebuilders.
Unit and/or central station air conditioning.
Unit and/or central station air conditioning.
Industrial consumers.
Condensing unit parts.
Evaporators, coils, and special condensers.
Packaged air conditioning.
Jobbers.
Service companies and service men.
Contractors and engineering firms outside the industry.
Testing instruments.
Valves and fittings.
Self-contained commercial refrigeration units.
Factory branches.
Refrigerator accessories.
Fans, blowers, ducts, grilles, and air cleaning & treating equip.
Display cases and market refrigerators.
National users.
Refrigerants, lubricating oils, and chemicals.
Temperature, pressure, and humidity controls.
Special design commercial refrigeration equipment.
Production, installation, and service tools.
Other fabricators.
Commercial and industrial refrigeration & central station air cond.
DISTRIBUTORS
HOUSEHOLD REFRIGERATION AND UNIT AIR CONDITIONING.
NUMBER: 600 to 750.
ANNUAL VOLUME: $200 to $225 millions.
SALES CHANNELS: Wholesale commission salesmen contact retail appliance dealers, utility operations, furniture stores, etc., who carry franchises and resell to consumers. Distributors work in limited protected territories, usually one state or less in size. A few of them operate retail stores in the city in which they are located, wholesale to dealers in the rest of the territory. Distributors may also carry stock of parts and operate a service department for their dealers.

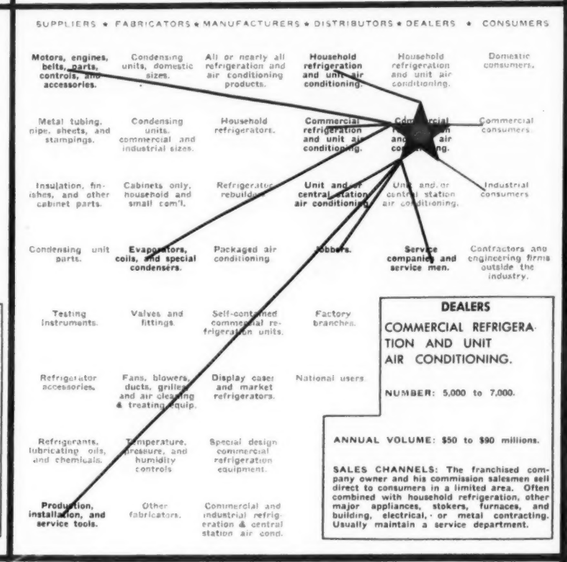

SUPPLIERS ★ FABRICATORS ★ MANUFACTURERS ★ DISTRIBUTORS ★ DEALERS ★ CONSUMERS
Motors, engines, belts, parts, controls, and accessories.
Condensing units, domestic sizes.
All or nearly all refrigeration and air conditioning products.
Household refrigeration and unit air conditioning.
Household refrigeration and unit air conditioning.
Domestic consumers.
Metal tubing, pipe, sheets, and stampings.
Condensing units, commercial and industrial sizes.
Household refrigerators.
Commercial refrigeration and unit air conditioning.
Commercial refrigeration and unit air conditioning.
Commercial consumers.
Insulation, finishes, and other cabinet parts.
Cabinets only, household and small com'l.
Refrigerator rebuilders.
Unit and/or central station air conditioning.
Unit and/or central station air conditioning.
Industrial consumers.
Condensing unit parts.
Evaporators, coils, and special condensers.
Packaged air conditioning.
Jobbers.
Service companies and service men.
Contractors and engineering firms outside the industry.
Testing instruments.
Valves and fittings.
Self-contained commercial refrigeration units.
Factory branches.
Refrigerator accessories.
Fans, blowers, ducts, grilles, and air cleaning & treating equip.
Display cases and market refrigerators.
National users.
Refrigerants, lubricating oils, and chemicals.
Temperature, pressure, and humidity controls.
Special design commercial refrigeration equipment.
Production, installation, and service tools.
Other fabricators.
Commercial and industrial refrigeration & central station air cond.
DEALERS
HOUSEHOLD REFRIGERATION AND UNIT AIR CONDITIONING.
NUMBER: 15,000 to 20,000.
ANNUAL VOLUME: $425 to $475 millions.
SALES CHANNELS: Franchised commission salesmen sell direct to domestic or small commercial consumers in a limited area. This operation is often combined with the handling of other major appliances, with small appliances, electrical supplies. Hardware, furniture, department stores, and public utilities may also be appliance dealers. Some have service departments, other depend on the distributor or a service contractor.


SUPPLIERS ★ FABRICATORS ★ MANUFACTURERS ★ DISTRIBUTORS ★ DEALERS ★ CONSUMERS
Motors, engines, belts, parts, controls, and accessories.
Condensing units, domestic sizes.
All or nearly all refrigeration and air conditioning products.
Household refrigeration and unit air conditioning.
Household refrigeration and unit air conditioning.
Domestic consumers.
Metal tubing, pipe, sheets, and stampings.
Condensing units, commercial and industrial sizes.
Household refrigerators.
Commercial refrigeration and unit air conditioning.
Commercial refrigeration and unit air conditioning.
Commercial consumers.
Insulation, finishes, and other cabinet parts.
Cabinets only, household and small com'l.
Refrigerator rebuilders.
Unit and/or central station air conditioning.
Unit and/or central station air conditioning.
Industrial consumers.
Condensing unit parts.
Evaporators, coils, and special condensers.
Packaged air conditioning.
Jobbers.
Service companies and service men.
Contractors and engineering firms outside the industry.
Testing instruments.
Valves and fittings.
Self-contained commercial refrigeration units.
Factory branches.
Refrigerator accessories.
Fans, blowers, ducts, grilles, and air cleaning & treating equip.
Display cases and market refrigerators.
National users.
Refrigerants, lubricating oils, and chemicals.
Temperature, pressure, and humidity controls.
Special design commercial refrigeration equipment.
Production, installation, and service tools.
Other fabricators.
Commercial and industrial refrigeration & central station air cond.
CONSUMERS
DOMESTIC.
NUMBER: 3 millions yearly.
ANNUAL BUYING VOLUME: $400 to $450 millions.
Residential buyers, real estate agents, property managers, and tenants of private and professional offices purchase from retail dealers.


★ DEALERS ★ CONSUMERS
Household refrigeration and unit air conditioning.
Domestic consumers.
Commercial refrigeration and unit air conditioning.
Commercial consumers.
Unit and/or central station air conditioning.
Industrial consumers.
Service companies and service men.
Contractors and engineering firms outside the industry.
FABRICATORS
CONDENSING UNITS, COMMERCIAL AND INDUSTRIAL SIZES.
NUMBER: 35 to 40.
HANNELS: Home office and district ell to complete unit assemblers ll equipment use, to franchised and retail distributors for field obs, to stocking wholesale jobbers to small installation and replace- operators.
IONS: Refrigeration Equipment rs Association, Standard Refrig- mpressor Association, Air Condi- Refrigerating Machinery Associa-


SUPPLIERS ★ FABRICATORS ★ MANUFACTURERS ★ DISTRIBUTORS ★ DEALERS ★ CONSUMERS
Motors, engines, belts, parts, controls, and accessories.
Condensing units, domestic sizes.
All or nearly all refrigeration and air conditioning products.
Household refrigeration and unit air conditioning.
Household refrigeration and unit air conditioning.
Domestic consumers.
Metal tubing, pipe, sheets, and stampings.
Condensing units, commercial and industrial sizes.
Household refrigerators.
Commercial refrigeration and unit air conditioning.
Commercial refrigeration and unit air conditioning.
Commercial consumers.
Insulation, finishes, and other cabinet parts.
Cabinets only, household and small com'l.
Refrigerator rebuilders.
Unit and/or central station air conditioning.
Unit and/or central station air conditioning.
Industrial consumers.
Condensing unit parts.
Evaporators, coils, and special condensers.
Packaged air conditioning.
Jobbers.
Service companies and service men.
Contractors and engineering firms outside the industry.
Testing instruments.
Valves and fittings.
Self-contained commercial refrigeration units.
Factory branches.
Refrigerator accessories.
Fans, blowers, ducts, grilles, and air cleaning & treating equip.
Display cases and market refrigerators.
National users.
Refrigerants, lubricating oils, and chemicals.
Temperature, pressure, and humidity controls.
Special design commercial refrigeration equipment.
Production, installation, and service tools.
Other fabricators.
Commercial and industrial refrigeration & central station air cond.
MANUFACTURERS
HOUSEHOLD REFRIGERATORS.
NUMBER: 15 to 20.
The majority of these companies buy many pre-fabricated parts and are chiefly assemblers of household refrigerators.
SALES CHANNELS: Home office or district salesmen contact exclusive franchised wholesale distributors who resell complete units (and usually parts) to retail dealers in their protected territories. A few concerns operate through their own mail order and retail outlets. A few others produce private label units for large distributors buying on contract.
ASSOCIATION: National Electrical Manufacturers Association.


SUPPLIERS ★ FABRICATORS ★ MANUFACTURERS ★ DISTRIBUTORS ★ DEALERS ★ CONSUMERS
Motors, engines, belts, parts, controls, and accessories.
Condensing units, domestic sizes.
All or nearly all refrigeration and air conditioning products.
Household refrigeration and unit air conditioning.
Household refrigeration and unit air conditioning.
Domestic consumers.
Metal tubing, pipe, sheets, and stampings.
Condensing units, commercial and industrial sizes.
Household refrigerators.
Commercial refrigeration and unit air conditioning.
Commercial refrigeration and unit air conditioning.
Commercial consumers.
Insulation, finishes, and other cabinet parts.
Cabinets only, household and small com'l.
Refrigerator rebuilders.
Unit and/or central station air conditioning.
Unit and/or central station air conditioning.
Industrial consumers.
Condensing unit parts.
Evaporators, coils, and special condensers.
Packaged air conditioning.
Jobbers.
Service companies and service men.
Contractors and engineering firms outside the industry.
Testing instruments.
Valves and fittings.
Self-contained commercial refrigeration units.
Factory branches.
Refrigerator accessories.
Fans, blowers, ducts, grilles, and air cleaning & treating equip.
Display cases and market refrigerators.
National users.
Refrigerants, lubricating oils, and chemicals.
Temperature, pressure, and humidity controls.
Special design commercial refrigeration equipment.
Production, installation, and service tools.
Other fabricators.
Commercial and industrial refrigeration & central station air cond.
DISTRIBUTORS
COMMERCIAL REFRIGERATION AND UNIT AIR CONDITIONING.
NUMBER: 3,000 to 3,500.
ANNUAL VOLUME: $75 to $125 millions.
SALES CHANNELS: The company owner and his commissioned salesmen sell direct to commercial consumers, but may also, if his franchise offers an exclusive territory, sub-franchise retail dealers to represent him in some parts of the territory. In such cases, the distributor becomes both a wholesaler and retailer. Distributors may also handle installation and service work for their dealers.


SUPPLIERS ★ FABRICATORS ★ MANUFACTURERS ★ DISTRIBUTORS ★ DEALERS ★ CONSUMERS
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All or nearly all refrigeration and air conditioning products.
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Domestic consumers.
Metal tubing, pipe, sheets, and stampings.
Condensing units, commercial and industrial sizes.
Household refrigerators.
Commercial refrigeration and unit air conditioning.
Commercial refrigeration and unit air conditioning.
Commercial consumers.
Insulation, finishes, and other cabinet parts.
Cabinets only, household and small com'l.
Refrigerator rebuilders.
Unit and/or central station air conditioning.
Unit and/or central station air conditioning.
Industrial consumers.
Condensing unit parts.
Evaporators, coils, and special condensers.
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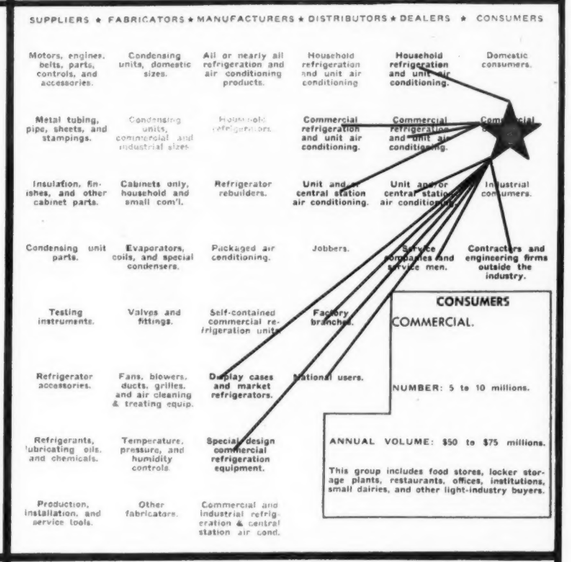
Fans, blowers, ducts, grilles, and air cleaning & treating equip.
Display cases and market refrigerators.
National users.
Refrigerants, lubricating oils, and chemicals.
Temperature, pressure, and humidity controls.
Special design commercial refrigeration equipment.
Production, installation, and service tools.
Other fabricators.
Commercial and industrial refrigeration & central station air cond.
DEALERS
COMMERCIAL REFRIGERATION AND UNIT AIR CONDITIONING.
NUMBER: 5,000 to 7,000.
ANNUAL VOLUME: $50 to $90 millions.
SALES CHANNELS: The franchised company owner and his commission salesmen sell direct to consumers in a limited area. Often combined with household refrigeration, other major appliances, stokers, furnaces, and building, electrical, or metal contracting. Usually maintain a service department.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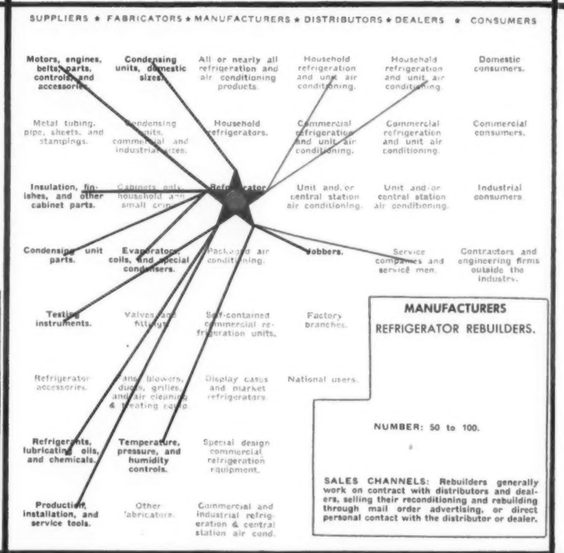
Temperature, pressure, and humidity controls.
Special design commercial refrigeration equipment.
Production, installation, and service tools.
Other fabricators.
Commercial and industrial refrigeration & central station air cond.
CONSUMERS
COMMERCIAL.
NUMBER: 5 to 10 millions.
ANNUAL VOLUME: $50 to $75 millions.
This group includes food stores, locker storage plants, restaurants, offices, institutions, small dairies, and other light-industry buyers.

★ DEALERS ★ CONSUMERS
Household refrigeration and unit air conditioning.
Domestic consumers.
Commercial refrigeration and unit air conditioning.
Commercial consumers.
Unit and/or central station air conditioning.
Industrial consumers.
Service companies and service men.
Contractors and engineering firms outside the industry.
FABRICATORS
CABINETS ONLY, HOUSEHOLD AND SMALL COMMERCIAL.
NUMBER: 80 to 100
HANNELS: Company salesmen sell equipment contract to assemblers units.
ON: Commercial Refrigerator rs Association.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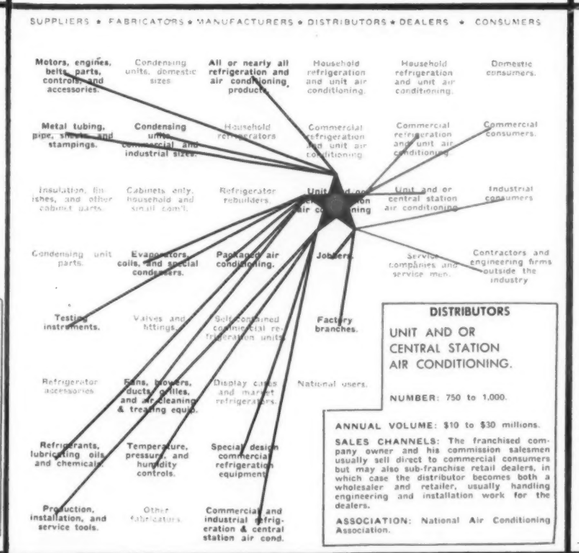
Production, installation, and service tools.
Other fabricators.
Commercial and industrial refrigeration & central station air cond.
MANUFACTURERS
REFRIGERATOR REBUILDERS.
NUMBER: 50 to 100.
SALES CHANNELS: Rebuilders generally work on contract with distributors and dealers, selling their reconditioning and rebuilding through mail order advertising, or direct personal contact with the distributor or dealer.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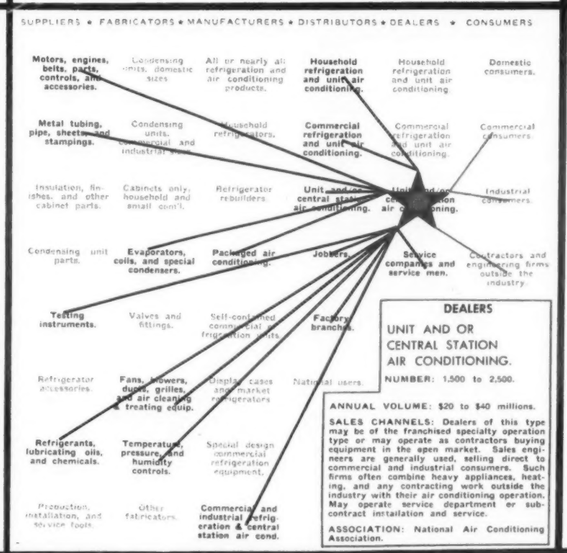
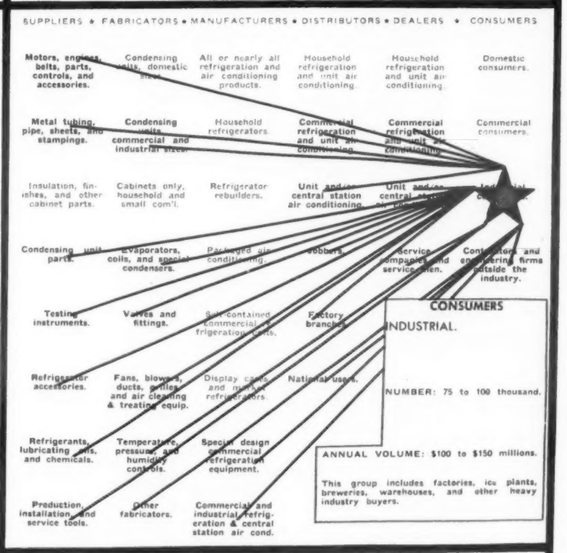
Commercial and industrial refrigeration & central station air cond.
DISTRIBUTORS
UNIT AND OR CENTRAL STATION AIR CONDITIONING.
NUMBER: 750 to 1,000.
ANNUAL VOLUME: $10 to $30 millions.
SALES CHANNELS: The franchised company owner and his commission salesmen usually sell direct to commercial consumers but may also sub-franchise retail dealers, in which case the distributor becomes both a wholesaler and retailer, usually handling engineering and installation work for the dealers.
ASSOCIATION: National Air Conditioning Association.


SUPPLIERS ★ FABRICATORS ★ MANUFACTURERS ★ DISTRIBUTORS ★ DEALERS ★ CONSUMERS
Motors, engines, belts, parts, controls, and accessories.
Condensing units, domestic sizes.
All or nearly all refrigeration and air conditioning products.
Household refrigeration and unit air conditioning.
Household refrigeration and unit air conditioning.
Domestic consumers.
Metal tubing, pipe, sheets, and stampings.
Condensing units, commercial and industrial sizes.
Household refrigerators.
Commercial refrigeration and unit air conditioning.
Commercial refrigeration and unit air conditioning.
Commercial consumers.
Insulation, finishes, and other cabinet parts.
Cabinets only, household and small com'l.
Refrigerator rebuilders.
Unit and/or central station air conditioning.
Unit and/or central station air conditioning.
Industrial consumers.
Condensing unit parts.
Evaporators, coils, and special condensers.
Packaged air conditioning.
Jobbers.
Service companies and service men.
Contractors and engineering firms outside the industry.
Testing instruments.
Valves and fittings.
Self-contained commercial refrigeration units.
Factory branches.
Refrigerator accessories.
Fans, blowers, ducts, grilles, and air cleaning & treating equip.
Display cases and market refrigerators.
National users.
Refrigerants, lubricating oils, and chemicals.
Temperature, pressure, and humidity controls.
Special design commercial refrigeration equipment.
Production, installation, and service tools.
Other fabricators.
Commercial and industrial refrigeration & central station air cond.
DEALERS
UNIT AND OR CENTRAL STATION AIR CONDITIONING.
NUMBER: 1,500 to 2,500.
ANNUAL VOLUME: $20 to $40 millions.
SALES CHANNELS: Dealers of this type may be of the franchised specialty operation type or may operate as contractors buying equipment in the open market. Sales engineers are generally used, selling direct to commercial and industrial consumers. Such firms often combine heavy appliances, heating, and any contracting work outside the industry with their air conditioning operation. May operate service department or subcontract installation and service.
ASSOCIATION: National Air Conditioning Association.


SUPPLIERS ★ FABRICATORS ★ MANUFACTURERS ★ DISTRIBUTORS ★ DEALERS ★ CONSUMERS
Motors, engines, belts, parts, controls, and accessories.
Condensing units, domestic sizes.
All or nearly all refrigeration and air conditioning products.
Household refrigeration and unit air conditioning.
Household refrigeration and unit air conditioning.
Domestic consumers.
Metal tubing, pipe, sheets, and stampings.
Condensing units, commercial and industrial sizes.
Household refrigerators.
Commercial refrigeration and unit air conditioning.
Commercial refrigeration and unit air conditioning.
Commercial consumers.
Insulation, finishes, and other cabinet parts.
Cabinets only, household and small com'l.
Refrigerator rebuilders.
Unit and/or central station air conditioning.
Unit and/or central station air conditioning.
Industrial consumers.
Condensing unit parts.
Evaporators, coils, and special condensers.
Packaged air conditioning.
Jobbers.
Service companies and service men.
Contractors and engineering firms outside the industry.
Testing instruments.
Valves and fittings.
Self-contained commercial refrigeration units.
Factory branches.
Refrigerator accessories.
Fans, blowers, ducts, grilles, and air cleaning & treating equip.
Display cases and market refrigerators.
National users.
Refrigerants, lubricating oils, and chemicals.
Temperature, pressure, and humidity controls.
Special design commercial refrigeration equipment.
Production, installation, and service tools.
Other fabricators.
Commercial and industrial refrigeration & central station air cond.
CONSUMERS
INDUSTRIAL.
NUMBER: 75 to 100 thousand.
ANNUAL VOLUME: $100 to $150 millions.
This group includes factories, ice plants, breweries, warehouses, and other heavy industry buyers.

★ DEALERS ★ CONSUMERS
Household refrigeration and unit air conditioning.
Domestic consumers.
Commercial refrigeration and unit air conditioning.
Commercial consumers.
Unit and/or central station air conditioning.
Industrial consumers.
Service companies and service men.
Contractors and engineering firms outside the industry.
FABRICATORS
EVAPORATORS, COILS, AND SPECIAL CONDENSERS.

SUPPLIERS ★ FABRICATORS ★ MANUFACTURERS ★ DISTRIBUTORS ★ DEALERS ★ CONSUMERS
Motors, engines, belts, parts, controls, and accessories.
Condensing units, domestic sizes.
All or nearly all refrigeration and air conditioning products.
Household refrigeration and unit air conditioning.
Household refrigeration and unit air conditioning.
Domestic consumers.
Metal tubing, pipe, sheets, and stampings.
Condensing units, commercial and industrial sizes.
Household refrigerators.
Commercial refrigeration and unit air conditioning.
Commercial refrigeration and unit air conditioning.
Commercial consumers.
Insulation, finishes, and other cabinet parts.
Cabinets only, household and small com'l.
Refrigerator rebuilders.
Unit and/or central station air conditioning.
Unit and/or central station air conditioning.
Industrial consumers.
Condensing unit parts.
Evaporators, coils, and special condensers.
Packaged air conditioning.
Jobbers.
Service companies and service men.
Contractors and engineering firms outside the industry.
Testing instruments.
Valves and fittings.
Self-contained commercial refrigeration units.
Factory branches.
MANUFACTURERS
PACKAGED AIR CONDITIONING.

SUPPLIERS ★ FABRICATORS ★ MANUFACTURERS ★ DISTRIBUTORS ★ DEALERS ★ CONSUMERS
Motors, engines, belts, parts, controls, and accessories.
Condensing units, domestic sizes.
All or nearly all refrigeration and air conditioning products.
Household refrigeration and unit air conditioning.
Household refrigeration and unit air conditioning.
Domestic consumers.
Metal tubing, pipe, sheets, and stampings.
Condensing units, commercial and industrial sizes.
Household refrigerators.
Commercial refrigeration and unit air conditioning.
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Insulation, finishes, and other cabinet parts.
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Industrial consumers.
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Evaporators, coils, and special condensers.
Packaged air conditioning.
Jobbers.
Service companies and service men.
Contractors and engineering firms outside the industry.
Testing instruments.
Valves and fittings.
Self-contained commercial refrigeration units.
Factory branches.
DISTRIBUTORS
JOBBERS.

SUPPLIERS ★ FABRICATORS ★ MANUFACTURERS ★ DISTRIBUTORS ★ DEALERS ★ CONSUMERS
Motors, engines, belts, parts, controls, and accessories.
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Evaporators, coils, and special condensers.
Packaged air conditioning.
Jobbers.
Service companies and service men.
Contractors and engineering firms outside the industry.
Testing instruments.
Valves and fittings.
Self-contained commercial refrigeration units.
Factory branches.
DEALERS
SERVICE COMPANIES AND SERVICE MEN.

SUPPLIERS ★ FABRICATORS ★ MANUFACTURERS ★ DISTRIBUTORS ★ DEALERS ★ CONSUMERS
Motors, engines, belts, parts, controls, and accessories.
Condensing units, domestic sizes.
All or nearly all refrigeration and air conditioning products.
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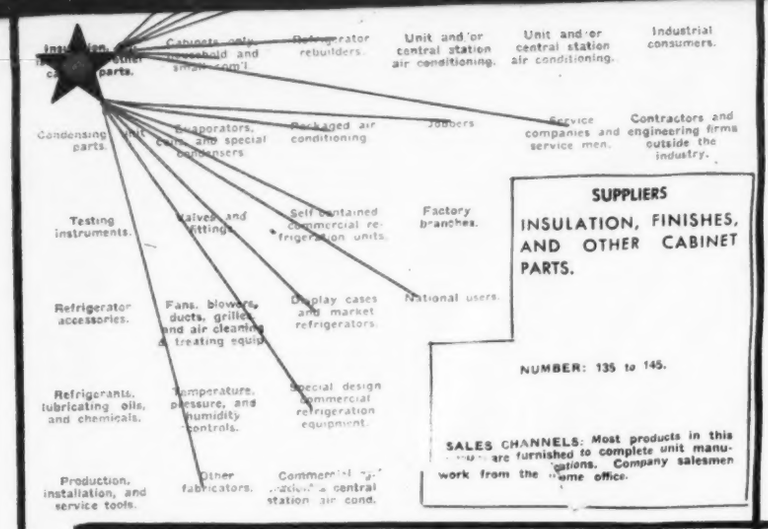
Packaged air conditioning.
Jobbers.
Service companies and service men.
Contractors and engineering firms outside the industry.
Testing instruments.
Valves and fittings.
Self-contained commercial refrigeration units.
Factory branches.
CONSUMERS
CONTRACTORS, CONTRACTING AND ENGINEERING FIRMS.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Industrial consumers.
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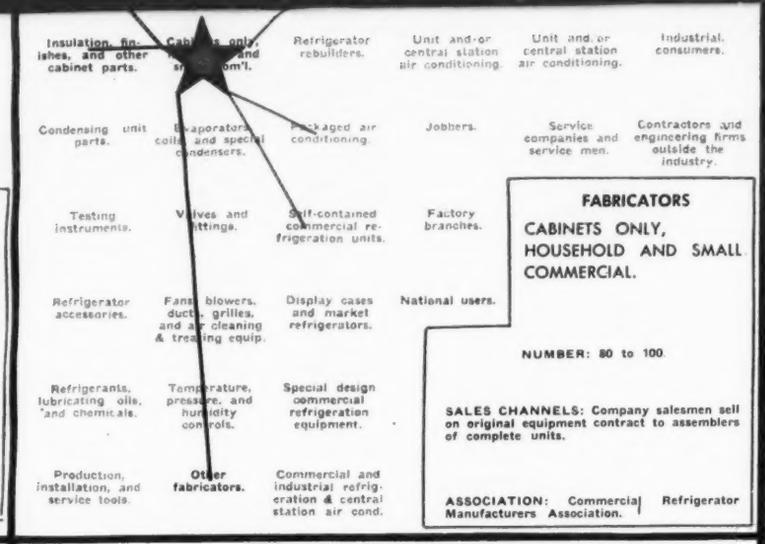
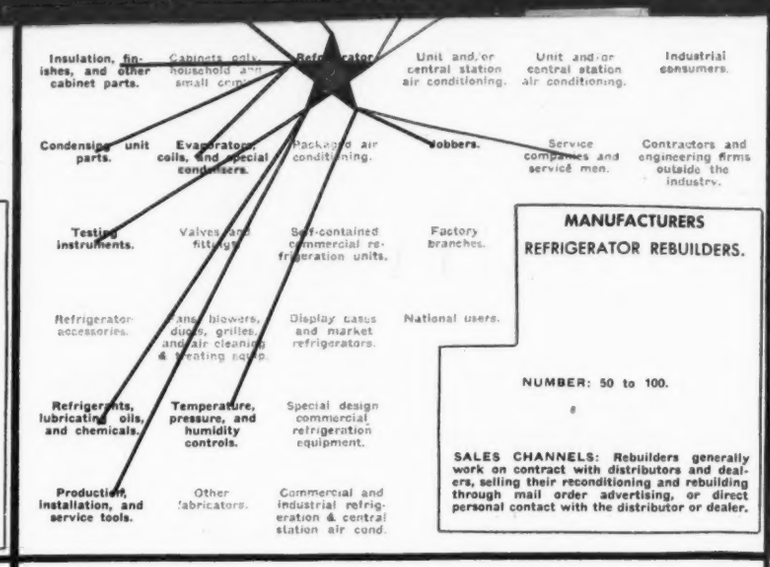
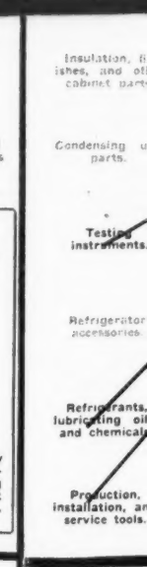
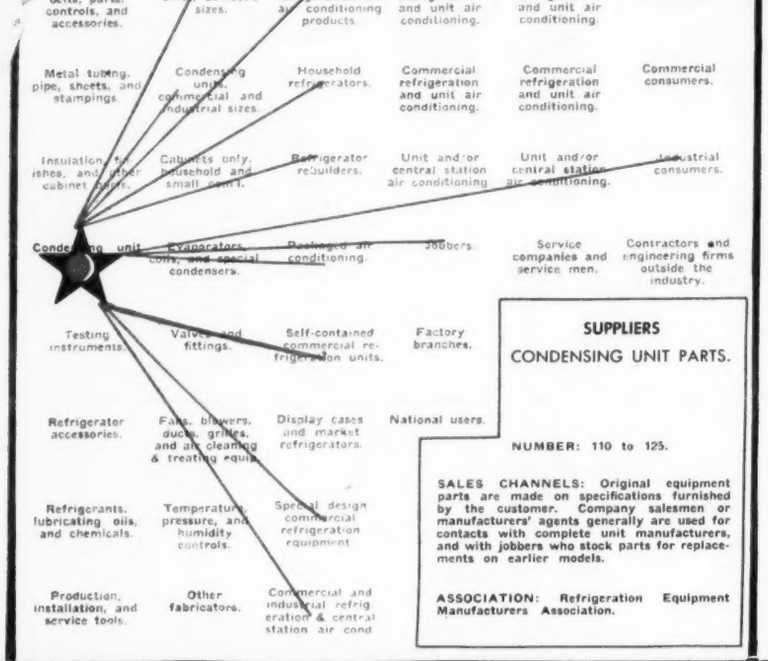
Packaged air conditioning.
Jobbers.
Service companies and service men.
Contractors and engineering firms outside the industry.
Testing instruments.
Valves and fittings.
Self-contained commercial refrigeration units.
Factory branches.
Refrigerator accessories.
Fans, blowers, ducts, grilles, and air cleaning & treating equip.
Display cases and market refrigerators.
National users.
Refrigerants, lubricating oils, and chemicals.
Temperature, pressure, and humidity controls.
Special design commercial refrigeration equipment.
Production, installation, and service tools.
Other fabricators.
Commercial and industrial refrigeration & central station air cond.
SUPPLIERS
INSULATION, FINISHES, AND OTHER CABINET PARTS.
NUMBER: 135 to 145.
SALES CHANNELS: Most products in this group are furnished to complete unit manufacturers' locations. Company salesmen work from the home office.


Insulation, finishes, and other cabinet parts.
Refrigerator rebuilders.
Unit and/or central station air conditioning.
Unit and/or central station air conditioning.
Industrial consumers.
Condensing unit parts.
Evaporators, coils, and special condensers.
Packaged air conditioning.
Jobbers.
Service companies and service men.
Contractors and engineering firms outside the industry.
Testing instruments.
Valves and fittings.
Self-contained commercial refrigeration units.
Factory branches.
Refrigerator accessories.
Fans, blowers, ducts, grilles, and air cleaning & treating equip.
Display cases and market refrigerators.
National users.
Refrigerants, lubricating oils, and chemicals.
Temperature, pressure, and humidity controls.
Special design commercial refrigeration equipment.
Production, installation, and service tools.
Other fabricators.
Commercial and industrial refrigeration & central station air cond.
FABRICATORS
CABINETS ONLY, HOUSEHOLD AND SMALL COMMERCIAL.
NUMBER: 80 to 100.
SALES CHANNELS: Company salesmen sell on original equipment contract to assemblers of complete units.
ASSOCIATION: Commercial Refrigerator Manufacturers Association.


Insulation, finishes, and other cabinet parts.
Cabinets only, household and small com'l.
Refrigerator rebuilders.
Unit and/or central station air conditioning.
Unit and/or central station air conditioning.
Industrial consumers.
Condensing unit parts.
Evaporators, coils, and special condensers.
Packaged air conditioning.
Jobbers.
Service companies and service men.
Contractors and engineering firms outside the industry.
Testing instruments.
Valves and fittings.
Self-contained commercial refrigeration units.
Factory branches.
Refrigerator accessories.
Fans, blowers, ducts, grilles, and air cleaning & treating equip.
Display cases and market refrigerators.
National users.
Refrigerants, lubricating oils, and chemicals.
Temperature, pressure, and humidity controls.
Special design commercial refrigeration equipment.
Production, installation, and service tools.
Other fabricators.
Commercial and industrial refrigeration & central station air cond.
MANUFACTURERS
REFRIGERATOR REBUILDERS.
NUMBER: 50 to 100.
SALES CHANNELS: Rebuilders generally work on contract with distributors and dealers, selling their reconditioning and rebuilding through mail order advertising, or direct personal contact with the distributor or dealer.


Insulation, fi
ishes, and ot
cabinet parts
Condensing u
parts.
Testing
instruments.
Refrigerator
accessories.
Refrigerants,
lubricating oil
and chemicals
Production,
installation, a
service tools.


SUPPLIERS ★ FABRICATORS ★ MANUFACTURERS ★ DISTRIBUTORS ★ DEALERS ★ CONSUMERS
Motors, engines, belts, parts, controls, and accessories.
Condensing units, domestic sizes.
All or nearly all refrigeration and air conditioning products.
Household refrigeration and unit air conditioning.
Household refrigeration and unit air conditioning.
Domestic consumers.
Metal tubing, pipe, sheets, and stampings.
Condensing units, commercial and industrial sizes.
Household refrigerators.
Commercial refrigeration and unit air conditioning.
Commercial refrigeration and unit air conditioning.
Commercial consumers.
Insulation, finishes, and other cabinet parts.
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Refrigerator rebuilders.
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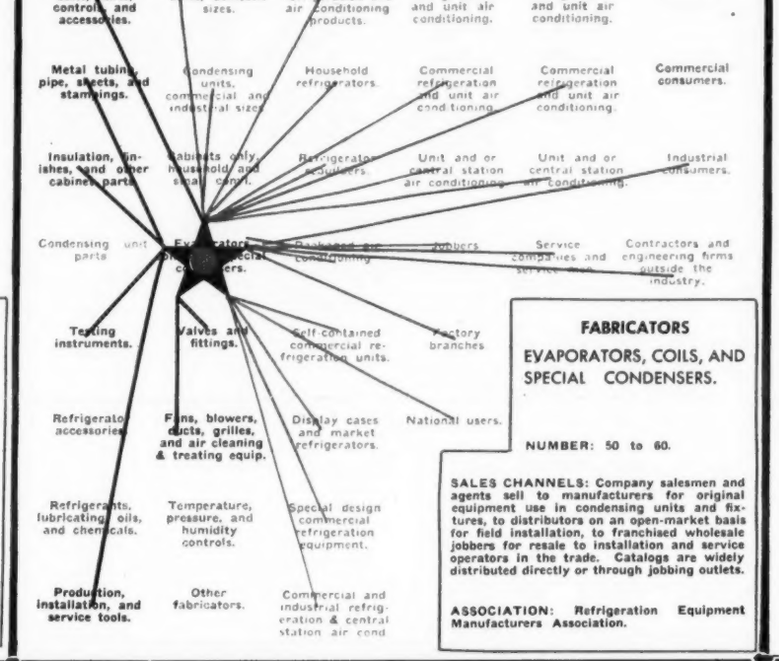
Unit and/or central station air conditioning.
Industrial consumers.
Condensing unit parts.
Evaporators, coils, and special condensers.
Packaged air conditioning.
Jobbers.
Service companies and service men.
Contractors and engineering firms outside the industry.
Testing instruments.
Valves and fittings.
Self-contained commercial refrigeration units.
Factory branches.
Refrigerator accessories.
Fans, blowers, ducts, grilles, and air cleaning & treating equip.
Display cases and market refrigerators.
National users.
Refrigerants, lubricating oils, and chemicals.
Temperature, pressure, and humidity controls.
Special design commercial refrigeration equipment.
Production, installation, and service tools.
Other fabricators.
Commercial and industrial refrigeration & central station air cond.
SUPPLIERS
CONDENSING UNIT PARTS.
NUMBER: 110 to 125.
SALES CHANNELS: Original equipment parts are made on specifications furnished by the customer. Company salesmen or manufacturers' agents generally are used for contacts with complete unit manufacturers, and with jobbers who stock parts for replacements on earlier models.
ASSOCIATION: Refrigeration Equipment Manufacturers Association.


SUPPLIERS ★ FABRICATORS ★ MANUFACTURERS ★ DISTRIBUTORS ★ DEALERS ★ CONSUMERS
Motors, engines, belts, parts, controls, and accessories.
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All or nearly all refrigeration and air conditioning products.
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Household refrigeration and unit air conditioning.
Domestic consumers.
Metal tubing, pipe, sheets, and stampings.
Condensing units, commercial and industrial sizes.
Household refrigerators.
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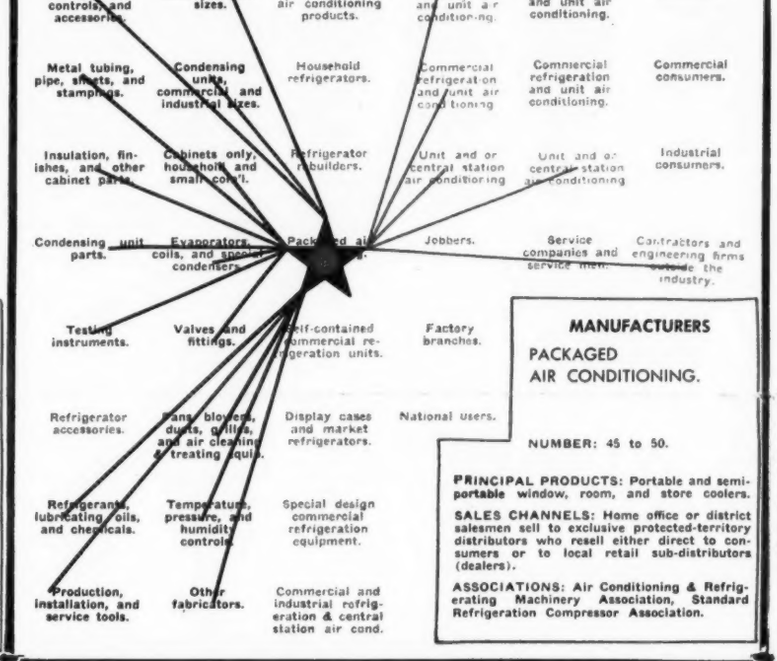
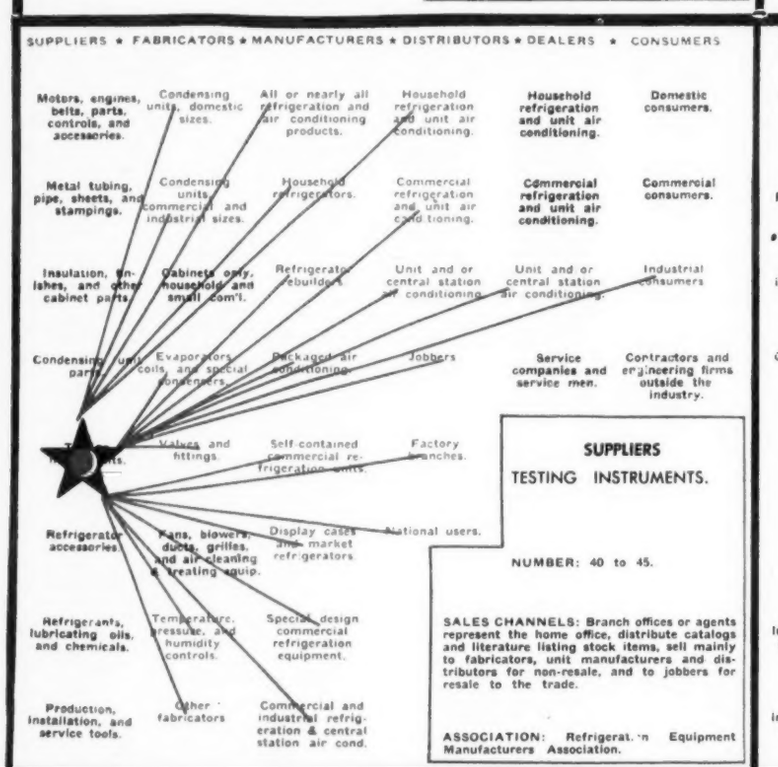
Commercial refrigeration and unit air conditioning.
Commercial consumers.
Insulation, finishes, and other cabinet parts.
Cabinets only, household and small com'l.
Refrigerator rebuilders.
Unit and/or central station air conditioning.
Unit and/or central station air conditioning.
Industrial consumers.
Condensing unit parts.
Evaporators, coils, and special condensers.
Packaged air conditioning.
Jobbers.
Service companies and service men.
Contractors and engineering firms outside the industry.
Testing instruments.
Valves and fittings.
Self-contained commercial refrigeration units.
Factory branches.
Refrigerator accessories.
Fans, blowers, ducts, grilles, and air cleaning & treating equip.
Display cases and market refrigerators.
National users.
Refrigerants, lubricating oils, and chemicals.
Temperature, pressure, and humidity controls.
Special design commercial refrigeration equipment.
Production, installation, and service tools.
Other fabricators.
Commercial and industrial refrigeration & central station air cond.
FABRICATORS
EVAPORATORS, COILS, AND SPECIAL CONDENSERS.
NUMBER: 50 to 60.
SALES CHANNELS: Company salesmen and agents sell to manufacturers for original equipment use in condensing units and fixtures, to distributors on an open-market basis for field installation, to franchised wholesale jobbers for resale to installation and service operators in the trade. Catalogs are widely distributed directly or through jobbing outlets.
ASSOCIATION: Refrigeration Equipment Manufacturers Association.


SUPPLIERS ★ FABRICATORS ★ MANUFACTURERS ★ DISTRIBUTORS ★ DEALERS ★ CONSUMERS
Motors, engines, belts, parts, controls, and accessories.
Condensing units, domestic sizes.
All or nearly all refrigeration and air conditioning products.
Household refrigeration and unit air conditioning.
Household refrigeration and unit air conditioning.
Domestic consumers.
Metal tubing, pipe, sheets, and stampings.
Condensing units, commercial and industrial sizes.
Household refrigerators.
Commercial refrigeration and unit air conditioning.
Commercial refrigeration and unit air conditioning.
Commercial consumers.
Insulation, finishes, and other cabinet parts.
Cabinets only, household and small com'l.
Refrigerator rebuilders.
Unit and/or central station air conditioning.
Unit and/or central station air conditioning.
Industrial consumers.
Condensing unit parts.
Evaporators, coils, and special condensers.
Packaged air conditioning.
Jobbers.
Service companies and service men.
Contractors and engineering firms outside the industry.
Testing instruments.
Valves and fittings.
Self-contained commercial refrigeration units.
Factory branches.
Refrigerator accessories.
Fans, blowers, ducts, grilles, and air cleaning & treating equip.
Display cases and market refrigerators.
National users.
Refrigerants, lubricating oils, and chemicals.
Temperature, pressure, and humidity controls.
Special design commercial refrigeration equipment.
Production, installation, and service tools.
Other fabricators.
Commercial and industrial refrigeration & central station air cond.
MANUFACTURERS
PACKAGED AIR CONDITIONING.
NUMBER: 45 to 50.
PRINCIPAL PRODUCTS: Portable and semi-portable window, room, and store coolers.
SALES CHANNELS: Home office or district salesmen sell to exclusive protected-territory distributors who resell either direct to consumers or to local retail sub-distributors (dealers).
ASSOCIATIONS: Air Conditioning & Refrigerating Machinery Association, Standard Refrigeration Compressor Association.

SUPPLIERS
Motors, engine
belts, parts,
controls, an
accessories.
Metal tubing
pipe, sheets,
stampings.
Insulation, fi
ishes, and oth
cabinet parts
Condensing u
parts.
Testing
instruments.
Refrigerator
accessories.
Refrigerants,
lubricating oil
and chemicals
Production,
installation, a
service tools.


SUPPLIERS ★ FABRICATORS ★ MANUFACTURERS ★ DISTRIBUTORS ★ DEALERS ★ CONSUMERS
Motors, engines, belts, parts, controls, and accessories.
Condensing units, domestic sizes.
All or nearly all refrigeration and air conditioning products.
Household refrigeration and unit air conditioning.
Household refrigeration and unit air conditioning.
Domestic consumers.
Metal tubing, pipe, sheets, and stampings.
Condensing units, commercial and industrial sizes.
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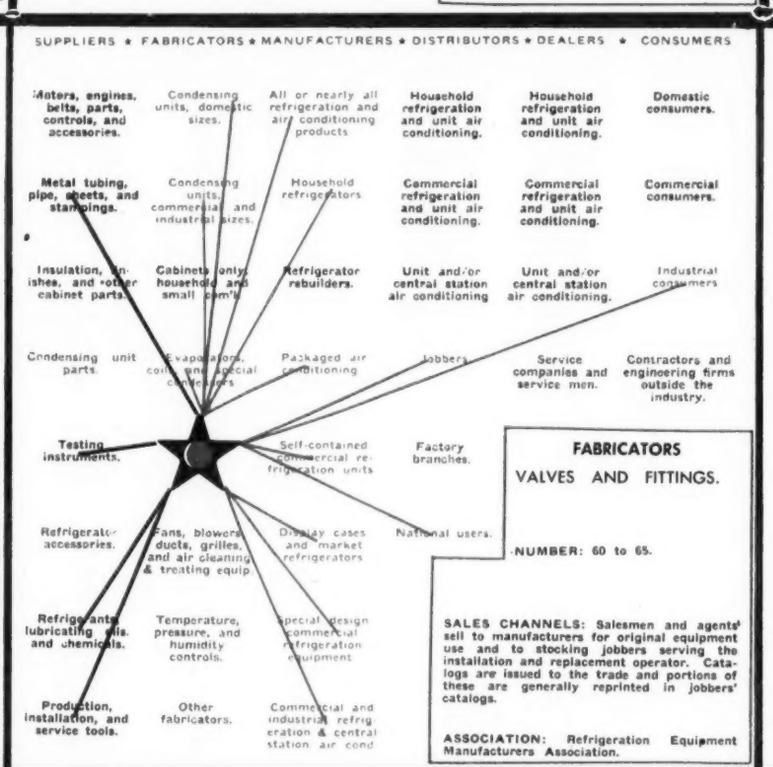
Refrigerator accessories.
Fans, blowers, ducts, grilles, and air cleaning & treating equip.
Display cases and market refrigerators.
National users.
Refrigerants, lubricating oils, and chemicals.
Temperature, pressure, and humidity controls.
Special design commercial refrigeration equipment.
Production, installation, and service tools.
Other fabricators
Commercial and industrial refrigeration & central station air cond.
SUPPLIERS
TESTING INSTRUMENTS.
NUMBER: 40 to 45.
SALES CHANNELS: Branch offices or agents represent the home office, distribute catalogs and literature listing stock items, sell mainly to fabricators, unit manufacturers and distributors for non-resale, and to jobbers for resale to the trade.
ASSOCIATION: Refrigeration Equipment Manufacturers Association.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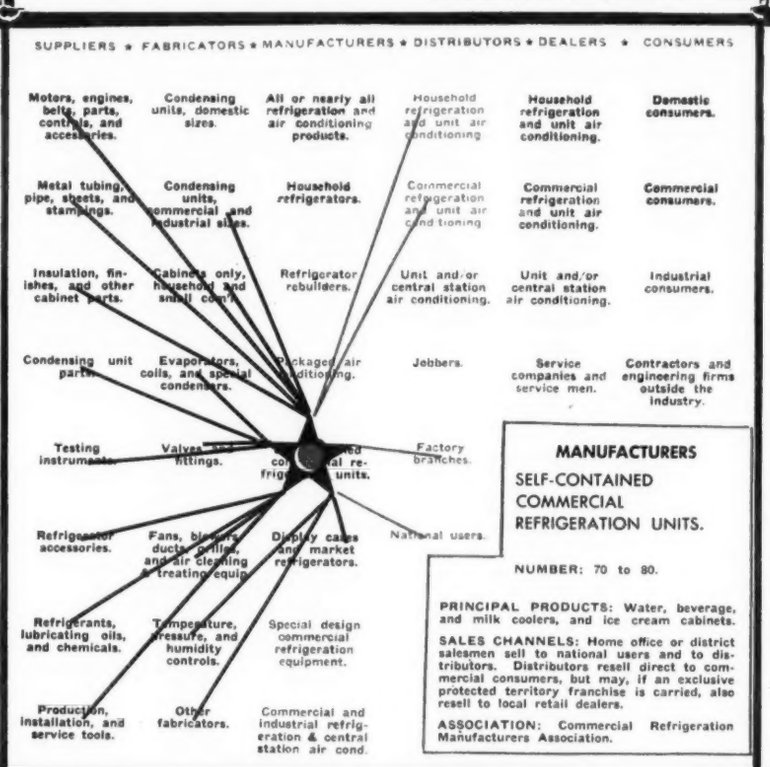
National users.
Refrigerants, lubricating oils, and chemicals.
Temperature, pressure, and humidity controls.
Special design commercial refrigeration equipment.
Production, installation, and service tools.
Other fabricators.
Commercial and industrial refrigeration & central station air cond.
FABRICATORS
VALVES AND FITTINGS.
NUMBER: 60 to 65.
SALES CHANNELS: Salesmen and agents sell to manufacturers for original equipment use and to stocking jobbers serving the installation and replacement operator. Catalogs are issued to the trade and portions of these are generally reprinted in jobbers' catalogs.
ASSOCIATION: Refrigeration Equipment Manufacturers Association.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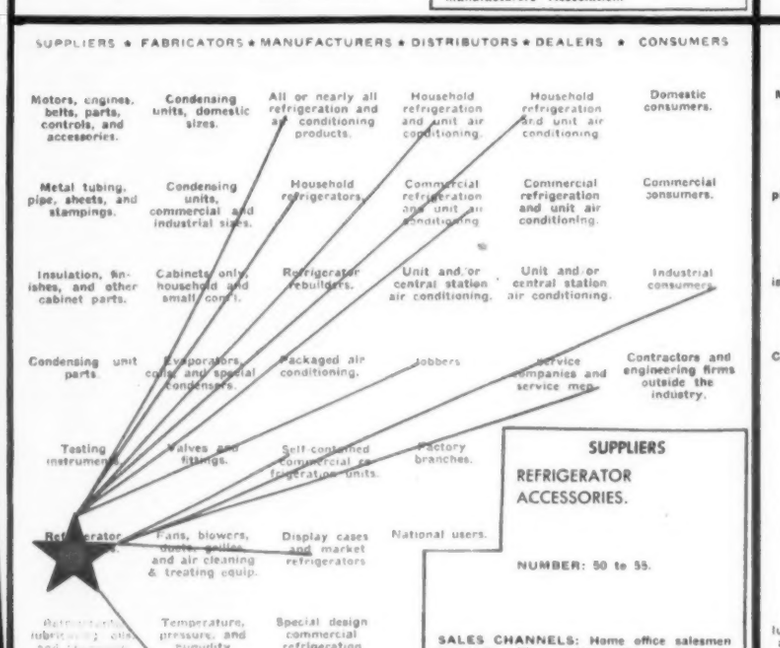
Motors, engines, belts, parts, controls, and accessories.
Condensing units, domestic sizes.
All or nearly all refrigeration and air conditioning products.
Household refrigeration and unit air conditioning.
Household refrigeration and unit air conditioning.
Domestic consumers.
Metal tubing, pipe, sheets, and stampings.
Condensing units, commercial and industrial sizes.
Household refrigerators.
Commercial refrigeration and unit air conditioning.
Commercial refrigeration and unit air conditioning.
Commercial consumers.
Insulation, finishes, and other cabinet parts.
Cabinets only, household and small com'l.
Refrigerator rebuilders.
Unit and/or central station air conditioning.
Unit and/or central station air conditioning.
Industrial consumers.
Condensing unit parts.
Evaporators, coils, and special condensers.
Packaged air conditioning.
Jobbers.
Service companies and service men.
Contractors and engineering firms outside the industry.
Testing instruments.
Valves and fittings.
Self-contained commercial refrigeration units.
Factory branches.
Refrigerator accessories.
Fans, blowers, ducts, grilles, and air cleaning & treating equip.
Display cases and market refrigerators.
National users.
Refrigerants, lubricating oils, and chemicals.
Temperature, pressure, and humidity controls.
Special design commercial refrigeration equipment.
Production, installation, and service tools.
Other fabricators.
Commercial and industrial refrigeration & central station air cond.
MANUFACTURERS
SELF-CONTAINED COMMERCIAL REFRIGERATION UNITS.
NUMBER: 70 to 80.
PRINCIPAL PRODUCTS: Water, beverage, and milk coolers, and ice cream cabinets.
SALES CHANNELS: Home office or district salesmen sell to national users and to distributors. Distributors resell direct to commercial consumers, but may, if an exclusive protected territory franchise is carried, also resell to local retail dealers.
ASSOCIATION: Commercial Refrigeration Manufacturers Association.

SUPPLIERS
Motors, engine
belts, parts,
controls, an
accessories.
Metal tubing
pipe, sheets,
stampings.
Insulation, fi
ishes, and oth
cabinet parts
Condensing u
parts.
Testing
instruments.
Refrigerator
accessories.
Refrigerants,
lubricating
and chemicals
Production,
installation, a
service tools.


SUPPLIERS ★ FABRICATORS ★ MANUFACTURERS ★ DISTRIBUTORS ★ DEALERS ★ CONSUMERS
Motors, engines, belts, parts, controls, and accessories.
Condensing units, domestic sizes.
All or nearly all refrigeration and air conditioning products.
Household refrigeration and unit air conditioning.
Household refrigeration and unit air conditioning.
Domestic consumers.
Metal tubing, pipe, sheets, and stampings.
Condensing units, commercial and industrial sizes.
Household refrigerators.
Commercial refrigeration and unit air conditioning.
Commercial refrigeration and unit air conditioning.
Commercial consumers.
Insulation, finishes, and other cabinet parts.
Cabinets only, household and small com'l.
Refrigerator rebuilders.
Unit and/or central station air conditioning.
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Industrial consumers.
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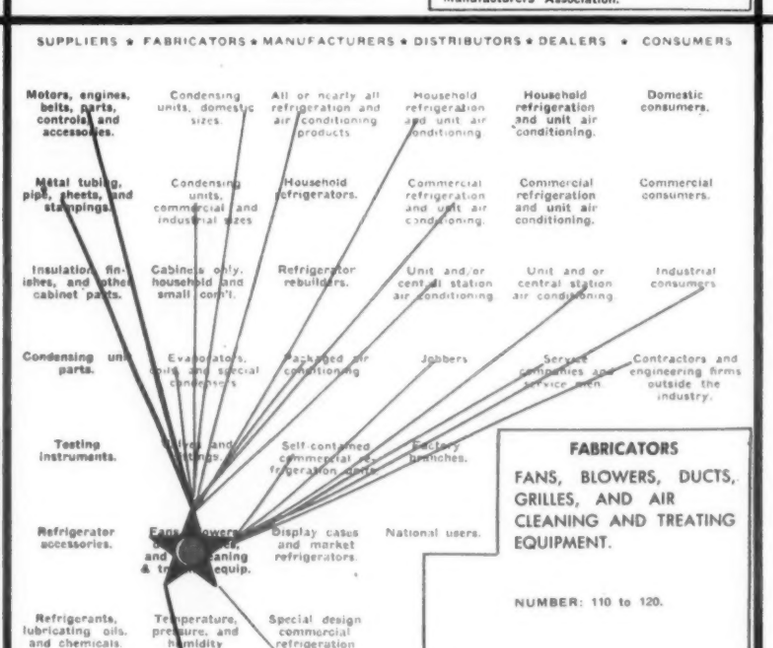
Factory branches.
Refrigerator accessories.
Fans, blowers, ducts, grilles, and air cleaning & treating equip.
Display cases and market refrigerators.
National users.
Refrigerants, lubricating oils, and chemicals.
Temperature, pressure, and humidity controls.
Special design commercial refrigeration equipment.
Production, installation, and service tools.
Other fabricators.
Commercial and industrial refrigeration & central station air cond.
SUPPLIERS
REFRIGERATOR ACCESSORIES.
NUMBER: 50 to 55.
SALES CHANNELS: Home office salesmen cooperate with complete unit manufacturers in designing accessories which are produced on contract for original equipment use. Installation accessories are sold by mail and personal contacts by agents to wholesale parts jobbers reselling to retail dealers and service men.


SUPPLIERS ★ FABRICATORS ★ MANUFACTURERS ★ DISTRIBUTORS ★ DEALERS ★ CONSUMERS
Motors, engines, belts, parts, controls, and accessories.
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Domestic consumers.
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Contractors and engineering firms outside the industry.
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Factory branches.
Refrigerator accessories.
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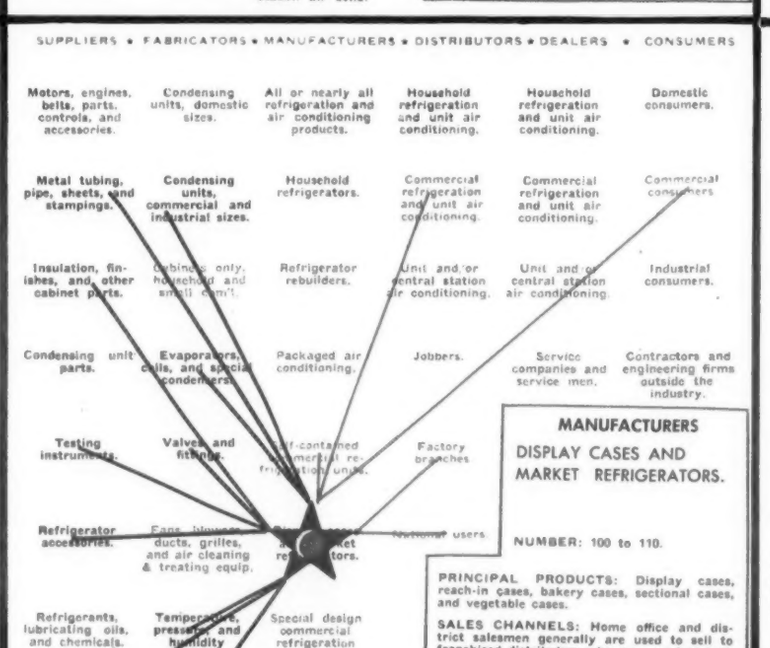
Display cases and market refrigerators.
National users.
Refrigerants, lubricating oils, and chemicals.
Temperature, pressure, and humidity controls.
Special design commercial refrigeration equipment.
Production, installation, and service tools.
Other fabricators.
Commercial and industrial refrigeration & central station air cond.
FABRICATORS
FANS, BLOWERS, DUCTS, GRILLES, AND AIR CLEANING AND TREATING EQUIPMENT.
NUMBER: 110 to 120.
SALES CHANNELS: Company salesmen, agents, and branch offices sell to manufacturers for original equipment use, to distributors of air conditioning for field assembled jobs, and to jobbers who resell to small trade operators for installation and replacement use.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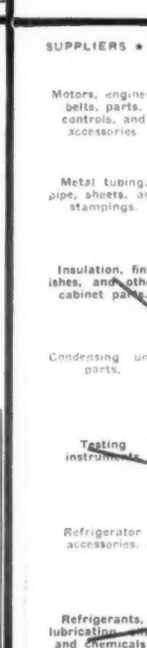
National users.
Refrigerants, lubricating oils, and chemicals.
Temperature, pressure, and humidity controls.
Special design commercial refrigeration equipment.
Production, installation, and service tools.
Other fabricators.
Commercial and industrial refrigeration & central station air cond.
MANUFACTURERS
DISPLAY CASES AND MARKET REFRIGERATORS.
NUMBER: 100 to 110.
PRINCIPAL PRODUCTS: Display cases, reach-in cases, bakery cases, sectional cases, and vegetable cases.
SALES CHANNELS: Home office and district salesmen generally are used to sell to franchised distributors who may conduct both a wholesale (reselling to retail dealers) and retail (selling direct to consumers) business. Some manufacturers use branches which conduct a wholesale and/or retail operation, and smaller organizations often sell direct to consumers.
ASSOCIATION: Commercial Refrigeration Manufacturers Association.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belts, parts,
controls, an
accessories.
Metal tubing
pipe, sheets,
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Insulation, fi
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lubricating
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installation, a
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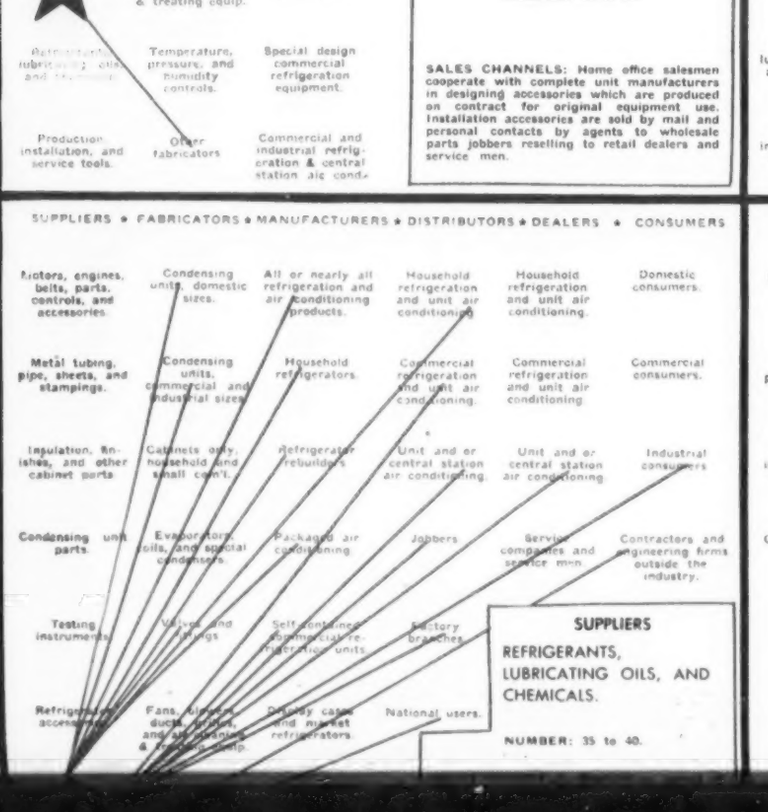
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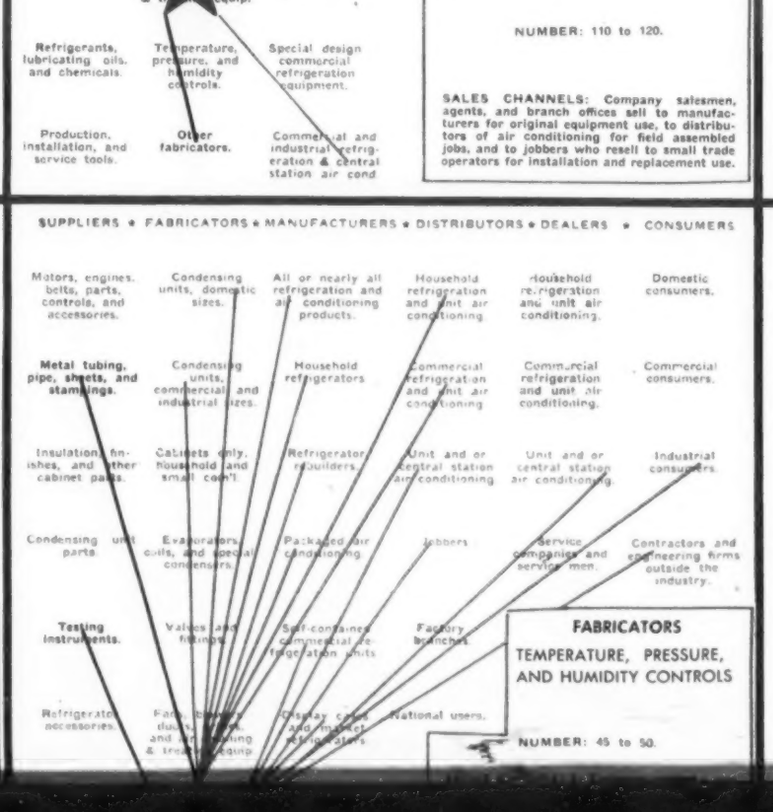
Insulation, finishes, and other cabinet parts.
Cabinets only, household and small com'l.
Refrigerator rebuilders.
Unit and/or central station air conditioning.
Unit and/or central station air conditioning.
Industrial consumers.
Condensing unit parts.
Evaporators, coils, and special condensers.
Packaged air conditioning.
Jobbers.
Service companies and service men.
Contractors and engineering firms outside the industry.
Testing instruments.
Valves and fittings.
Self-contained commercial refrigeration units.
Factory branches.
Refrigerator accessories.
Fans, blowers, ducts, grilles, and air cleaning & treating equip.
Display cases and market refrigerators.
National users.
Refrigerants, lubricating oils, and chemicals.
Temperature, pressure, and humidity controls.
Special design commercial refrigeration equipment.
Production, installation, and service tools.
Other fabricators.
Commercial and industrial refrigeration & central station air cond.
SUPPLIERS
REFRIGERANTS, LUBRICATING OILS, AND CHEMICALS.
NUMBER: 35 to 40.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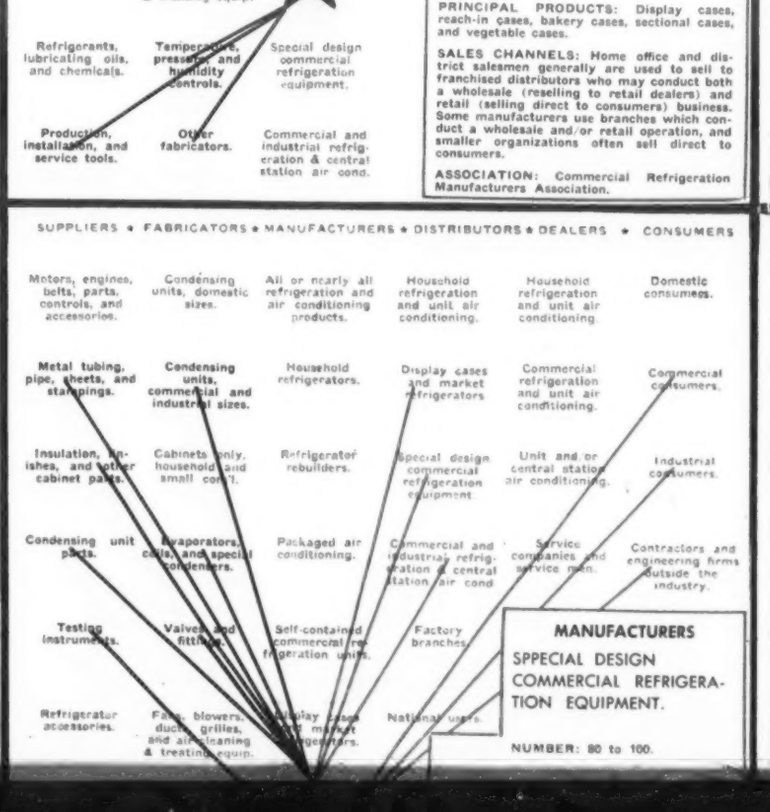
FABRICATORS
TEMPERATURE, PRESSURE, AND HUMIDITY CONTROLS
NUMBER: 45 to 50.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Production, installation, and service tools.
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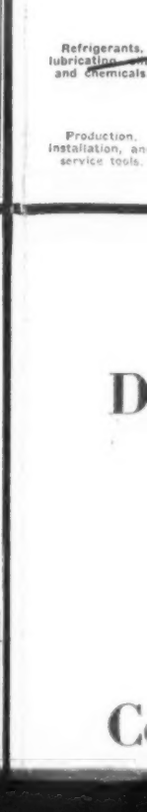
Commercial and industrial refrigeration & central station air cond.
MANUFACTURERS
SPPECIAL DESIGN COMMERCIAL REFRIGERATION EQUIPMENT.
NUMBER: 80 to 100.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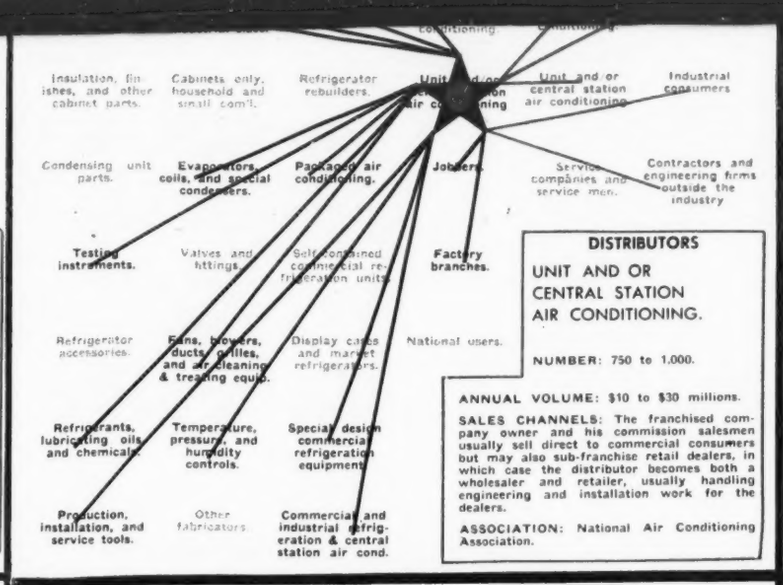
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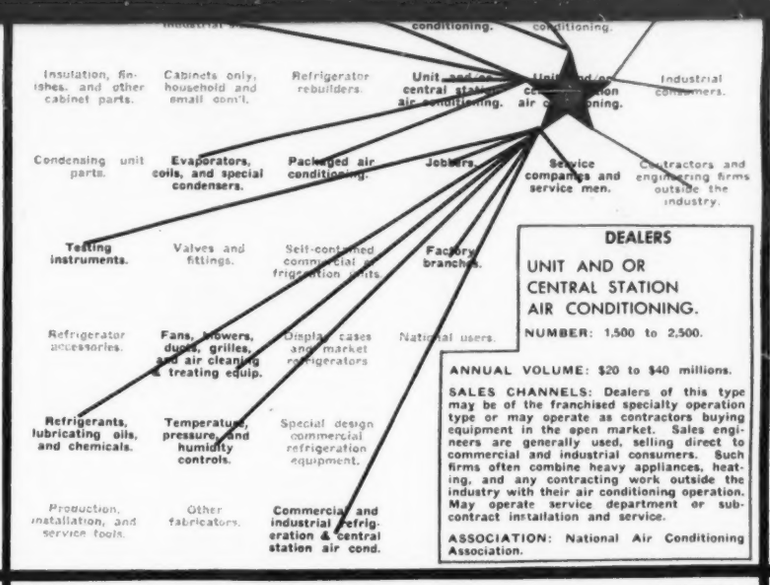
National users.
Refrigerants, lubricating oils and chemicals.
Temperature, pressure, and humidity controls.
Special design commercial refrigeration equipment.
Production, installation, and service tools.
Other fabricators.
Commercial and industrial refrigeration & central station air cond.
DISTRIBUTORS
UNIT AND OR CENTRAL STATION AIR CONDITIONING.
NUMBER: 750 to 1,000.
ANNUAL VOLUME: $10 to $30 millions.
SALES CHANNELS: The franchised company owner and his commission salesmen usually sell direct to commercial consumers but may also sub-franchise retail dealers, in which case the distributor becomes both a wholesaler and retailer, usually handling engineering and installation work for the dealers.
ASSOCIATION: National Air Conditioning Association.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Insulation, finishes, and other cabinet parts.
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Packaged air conditioning.
Jobbers.
Service companies and service men.
Contractors and engineering firms outside the industry.
Testing instruments.
Valves and fittings.
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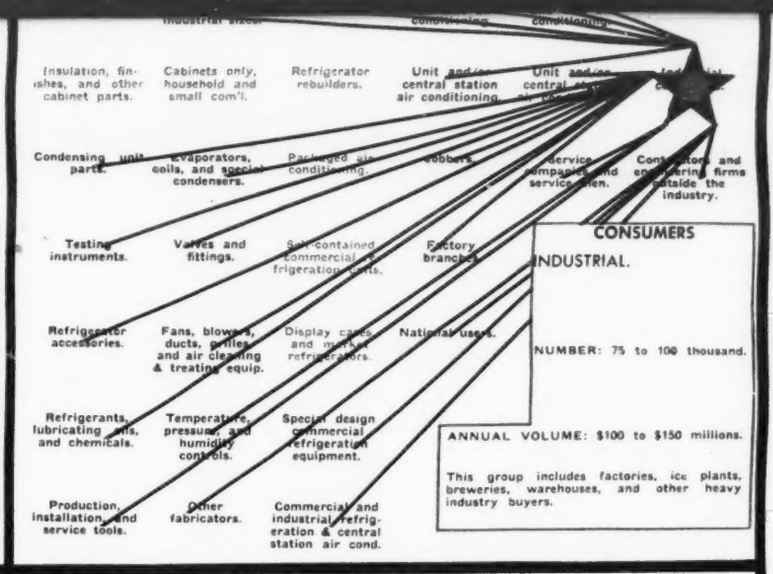
Factory branches.
Refrigerator accessories.
Fans, blowers, ducts, grilles, and air cleaning & treating equip.
Display cases and market refrigerators.
National users.
Refrigerants, lubricating oils, and chemicals.
Temperature, pressure, and humidity controls.
Special design commercial refrigeration equipment.
Production, installation, and service tools.
Other fabricators.
Commercial and industrial refrigeration & central station air cond.
DEALERS
UNIT AND OR CENTRAL STATION AIR CONDITIONING.
NUMBER: 1,500 to 2,500.
ANNUAL VOLUME: $20 to $40 millions.
SALES CHANNELS: Dealers of this type may be of the franchised specialty operation type or may operate as contractors buying equipment in the open market. Sales engineers are generally used, selling direct to commercial and industrial consumers. Such firms often combine heavy appliances, heating, and any contracting work outside the industry with their air conditioning operation. May operate service department or subcontract installation and service.
ASSOCIATION: National Air Conditioning Association.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National users.
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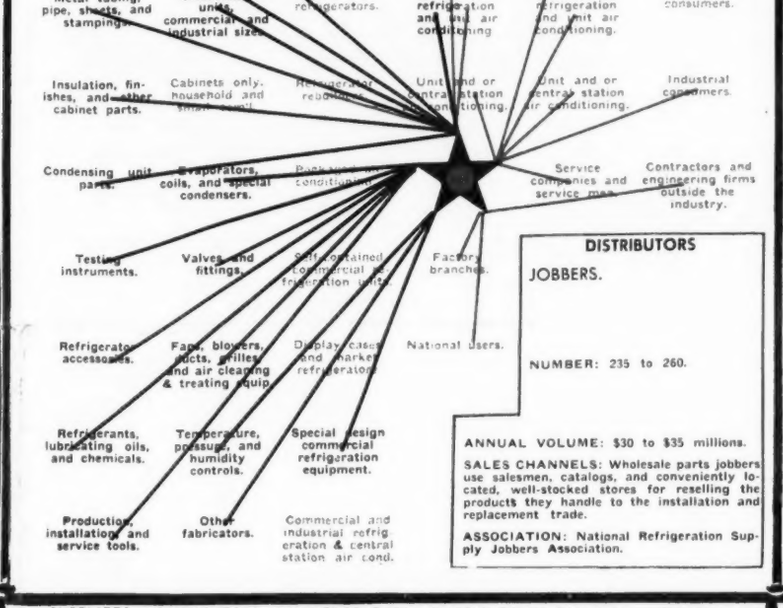
Temperature, pressure, and humidity controls.
Special design commercial refrigeration equipment.
Production, installation, and service tools.
Other fabricators.
Commercial and industrial refrigeration & central station air cond.
CONSUMERS
INDUSTRIAL.
NUMBER: 75 to 100 thousand.
ANNUAL VOLUME: $100 to $150 millions.
This group includes factories, ice plants, breweries, warehouses, and other heavy industry buyers.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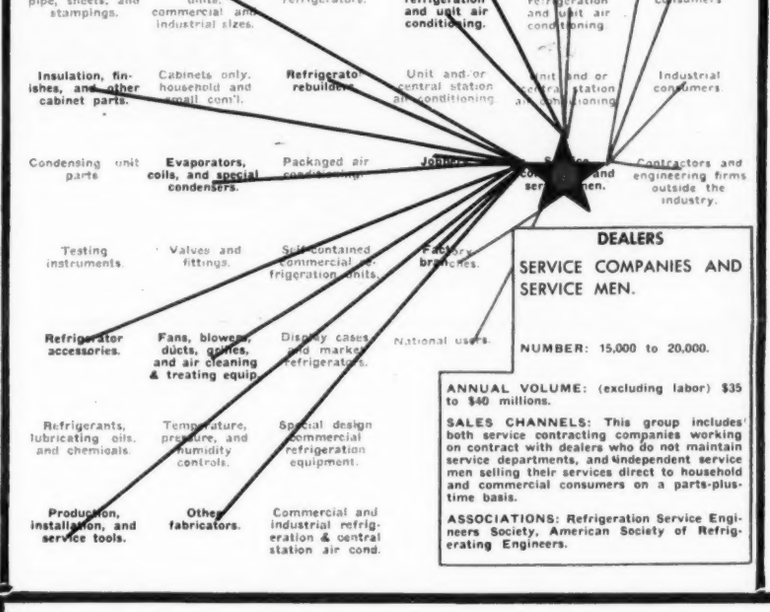
DISTRIBUTORS
JOBBERS.
NUMBER: 235 to 260.
ANNUAL VOLUME: $30 to $35 millions.
SALES CHANNELS: Wholesale parts jobbers use salesmen, catalogs, and conveniently located, well-stocked stores for reselling the products they handle to the installation and replacement trade.
ASSOCIATION: National Refrigeration Supply Jobbers Association.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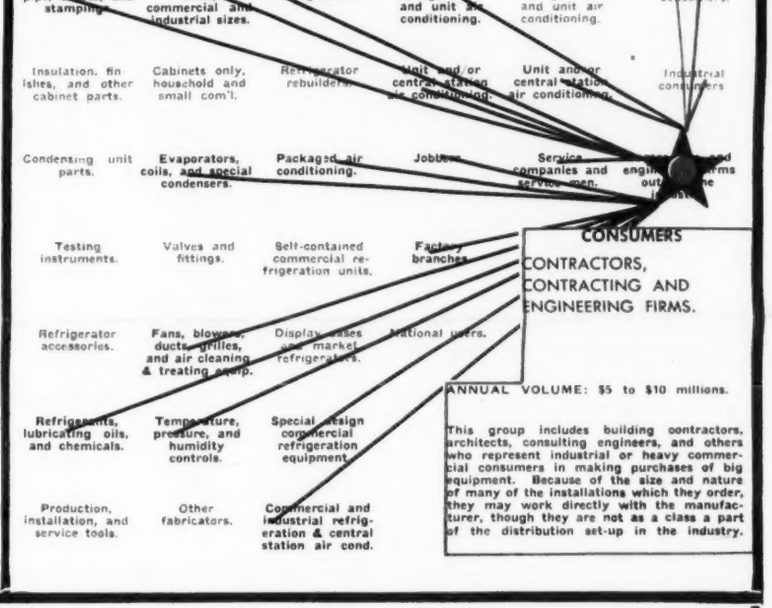
Other fabricators.
Commercial and industrial refrigeration & central station air cond.
DEALERS
SERVICE COMPANIES AND SERVICE MEN.
NUMBER: 15,000 to 20,000.
ANNUAL VOLUME: (excluding labor) $35 to $40 millions.
SALES CHANNELS: This group includes both service contracting companies working on contract with dealers who do not maintain service departments, and independent service men selling their services direct to household and commercial consumers on a parts-plus-time basis.
ASSOCIATIONS: Refrigeration Service Engineers Society, American Society of Refrigerating Engineers.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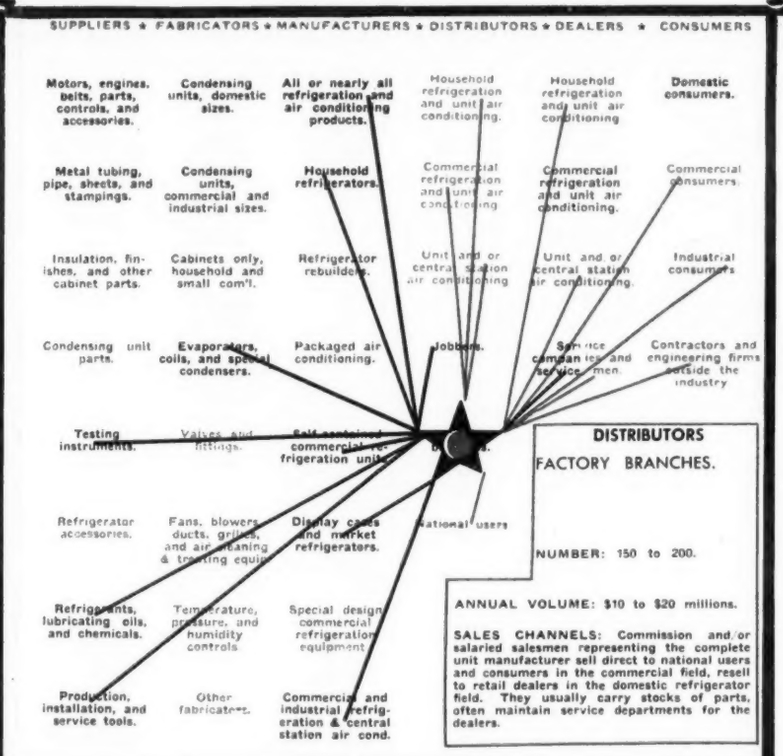
Unit and/or central station air conditioning.
Industrial consumers.
Condensing unit parts.
Evaporators, coils, and special condensers.
Packaged air conditioning.
Jobbers.
Service companies and service men.
Contractors and engineering firms outside the industry.
Testing instruments.
Valves and fittings.
Self-contained commercial refrigeration units.
Factory branches.
Refrigerator accessories.
Fans, blowers, ducts, grilles, and air cleaning & treating equip.
Display cases and market refrigerators.
National users.
Refrigerants, lubricating oils, and chemicals.
Temperature, pressure, and humidity controls.
Special design commercial refrigeration equipment.
Production, installation, and service tools.
Other fabricators.
Commercial and industrial refrigeration & central station air cond.
CONSUMERS
CONTRACTORS, CONTRACTING AND ENGINEERING FIRMS.
ANNUAL VOLUME: $5 to $10 millions.
This group includes building contractors, architects, consulting engineers, and others who represent industrial or heavy commercial consumers in making purchases of big equipment. Because of the size and nature of many of the installations which they order, they may work directly with the manufacturer, though they are not as a class a part of the distribution set-up in the industry.


SUPPLIERS ★ FABRICATORS ★ MANUFACTURERS ★ DISTRIBUTORS ★ DEALERS ★ CONSUMERS
Motors, engines, belts, parts, controls, and accessories.
Condensing units, domestic sizes.
All or nearly all refrigeration and air conditioning products.
Household refrigeration and unit air conditioning.
Household refrigeration and unit air conditioning
Domestic consumers.
Metal tubing, pipe, sheets, and stampings.
Condensing units, commercial and industrial sizes.
Household refrigerators.
Commercial refrigeration and unit air conditioning.
Commercial refrigeration and unit air conditioning.
Commercial consumers.
Insulation, finishes, and other cabinet parts.
Cabinets only, household and small com'l.
Refrigerator rebuilders.
Unit and/or central station air conditioning.
Unit and/or central station air conditioning.
Industrial consumers.
Condensing unit parts.
Evaporators, coils, and special condensers.
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Jobbers.
Service companies and service men.
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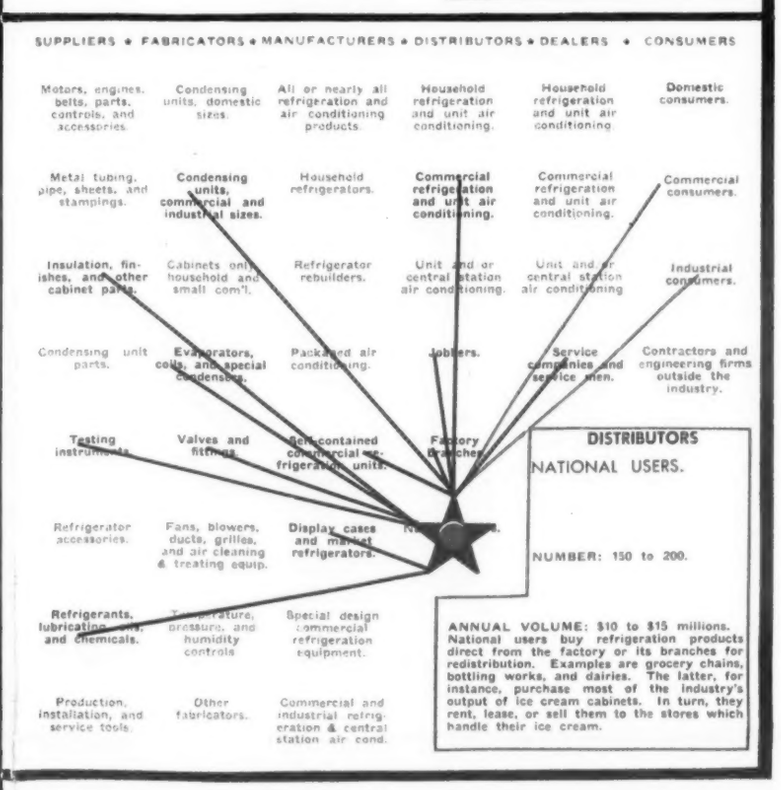
Refrigerants, lubricating oils, and chemicals.
Temperature, pressure, and humidity controls.
Special design commercial refrigeration equipment.
Production, installation, and service tools.
Other fabricators.
Commercial and industrial refrigeration & central station air cond.
DISTRIBUTORS
FACTORY BRANCHES.
NUMBER: 150 to 200.
ANNUAL VOLUME: $10 to $20 millions.
SALES CHANNELS: Commission and/or salaried salesmen representing the complete unit manufacturer sell direct to national users and consumers in the commercial field, resell to retail dealers in the domestic refrigerator field. They usually carry stocks of parts, often maintain service departments for the dealers.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Special design commercial refrigeration equipment.
Production, installation, and service tools.
Other fabricators.
Commercial and industrial refrigeration & central station air cond.
DISTRIBUTORS
NATIONAL USERS.
NUMBER: 150 to 200.
ANNUAL VOLUME: $10 to $15 millions. National users buy refrigeration products direct from the factory or its branches for redistribution. Examples are grocery chains, bottling works, and dairies. The latter, for instance, purchase most of the industry's output of ice cream cabinets. In turn, they rent, lease, or sell them to the stores which handle their ice cream.

How To Use This Chart

Purchases

THIS chart has been compiled to illustrate the refrigeration and air conditioning industry's distribution methods. Through six vertical columns it indicates, from left to right across the chart, the flow of goods from materials producers to ultimate consumers.

The chart is divided into 38 squares, each representing one of the 38 different general *types* of suppliers, fabricators, unit manufacturers, distributors, dealers, and consumers serving or served by the industry.

Each of these squares is a reproduction, in miniature, of the entire chart. The star within each square represents the relative position of the square to the entire chart, and the relative position of the type of company or individual covered by the star to the distribution plan of the entire industry. Arrangement of squares within each vertical column is based on convenience and does not necessarily indicate relative importance of the various types of organizations with the columns.

Brown lines radiating from the star indicate the main sources from which such a company usually buys. Green lines indicate the different types of companies or individuals to which such a company usually sells.

Sales

For example, the motor supplier's sale to the fabricator of domestic condensing units is shown by a green line in the square at the top of the "Suppliers" Column. This purchase is also represented by a brown line in the square devoted to the domestic condensing unit fabricator at the top of the "Fabricators" Column, and his sale of the completed unit to the manufacturer of household refrigerators is indicated by a green line in the same square.

The purchase of this condensing unit by the manufacturer of household refrigerators is shown by a brown line in the second square from the top of the "Manufacturers" Column. His sale of the complete refrigerator to a distributor of household refrigerators is shown by a green line in the same square.

Similarly, the distributor's purchase of this unit, its resale to the dealer, the dealer's purchase of it and its resale to the consumer, and the domestic consumer's purchase are shown by brown and green lines in squares at the top of the "Distributors," "Dealers," and "Consumers" Columns.

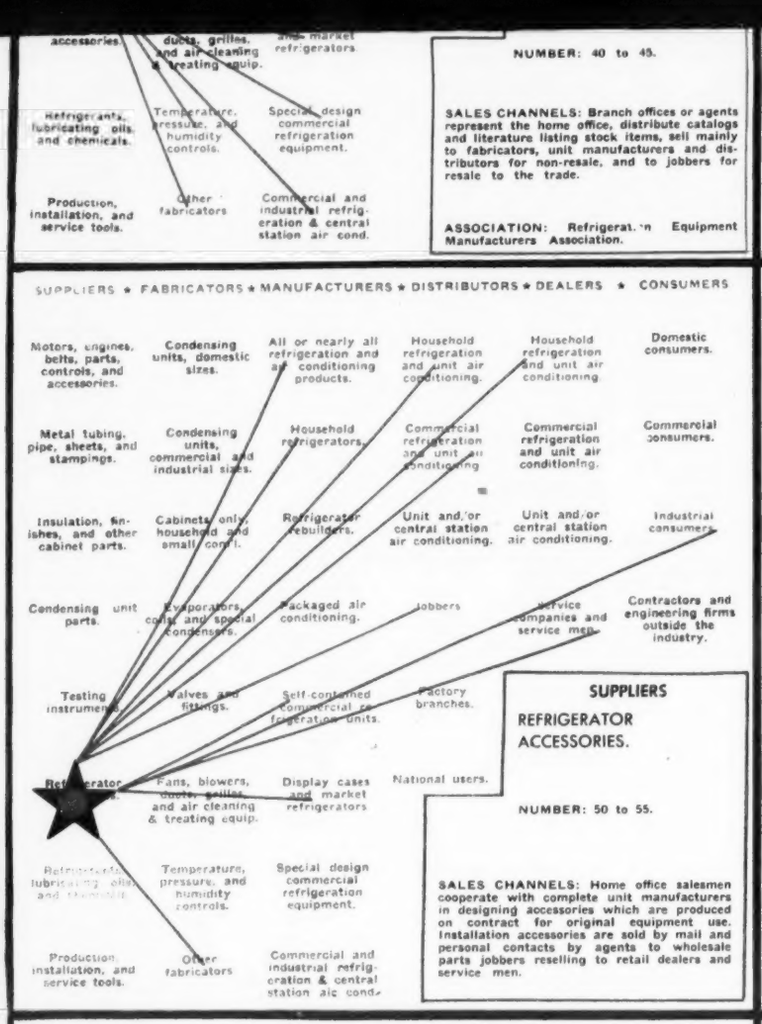
Table of The Industry's Sales in 1940

Domestic Refrigeration—*A $418,880,000 market*

WORLD SALES	EXPORTS	U. S. SALES	RETIREMENTS	TOTAL IN USE JAN. 1, 1941	WIRED HOMES
2,720,000	150,000	2,570,000	280,000	15,855,000	25,536,627

PER CENT SATURATION	AVERAGE SIZE	AVERAGE VALUE	TOTAL RETAIL VALUE
63.5	6.5 CU. FT.	$154	$418,880,000

Commercial Refrigeration—*A $219,282,000 market*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Motors, engines, belts, parts, controls, and accessories.
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All or nearly all refrigeration and air conditioning products.
Household refrigeration and unit air conditioning.
Household refrigeration and unit air conditioning.
Domestic consumers.
Metal tubing, pipe, sheets, and stampings.
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Evaporators, coils, and special condensers.
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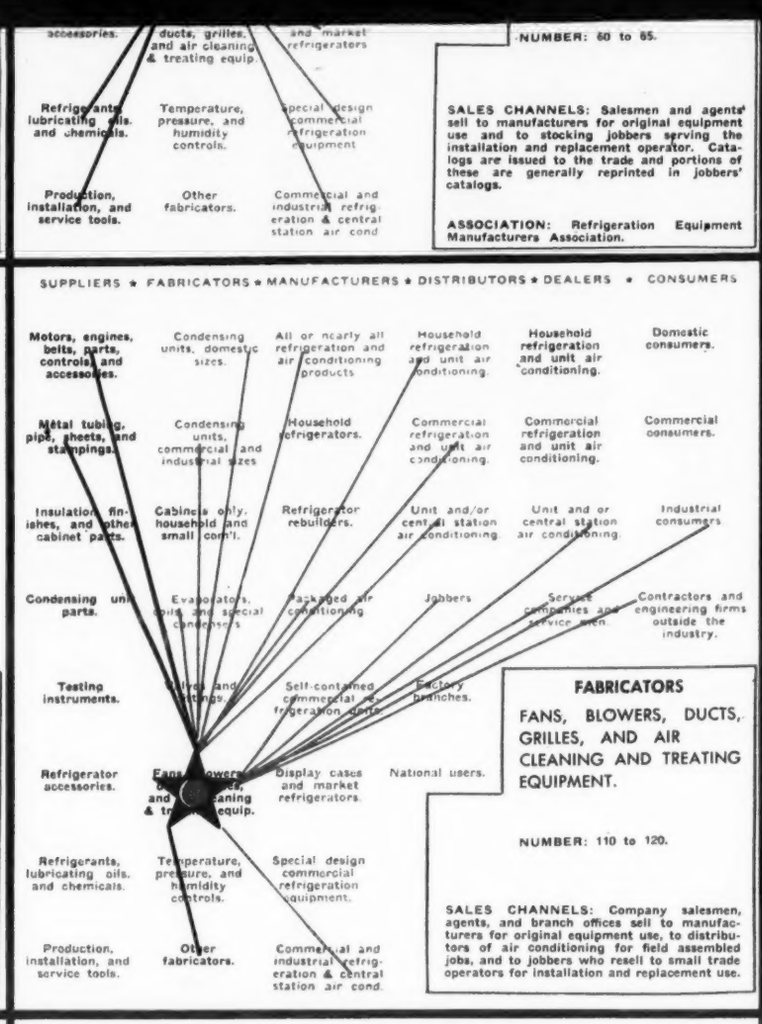
Jobbers.
Service companies and service men.
Contractors and engineering firms outside the industry.
Testing instruments.
Valves and fittings.
Self-contained commercial refrigeration units.
Factory branches.
Refrigerator accessories.
Fans, blowers, ducts, grilles, and air cleaning & treating equip.
Display cases and market refrigerators.
National users.
Refrigerants, lubricating oils, and chemicals.
Temperature, pressure, and humidity controls.
Special design commercial refrigeration equipment.
Production, installation, and service tools.
Other fabricators.
Commercial and industrial refrigeration & central station air cond.
SUPPLIERS
REFRIGERATOR ACCESSORIES.
NUMBER: 50 to 55.
SALES CHANNELS: Home office salesmen cooperate with complete unit manufacturers in designing accessories which are produced on contract for original equipment use. Installation accessories are sold by mail and personal contacts by agents to wholesale parts jobbers reselling to retail dealers and service men.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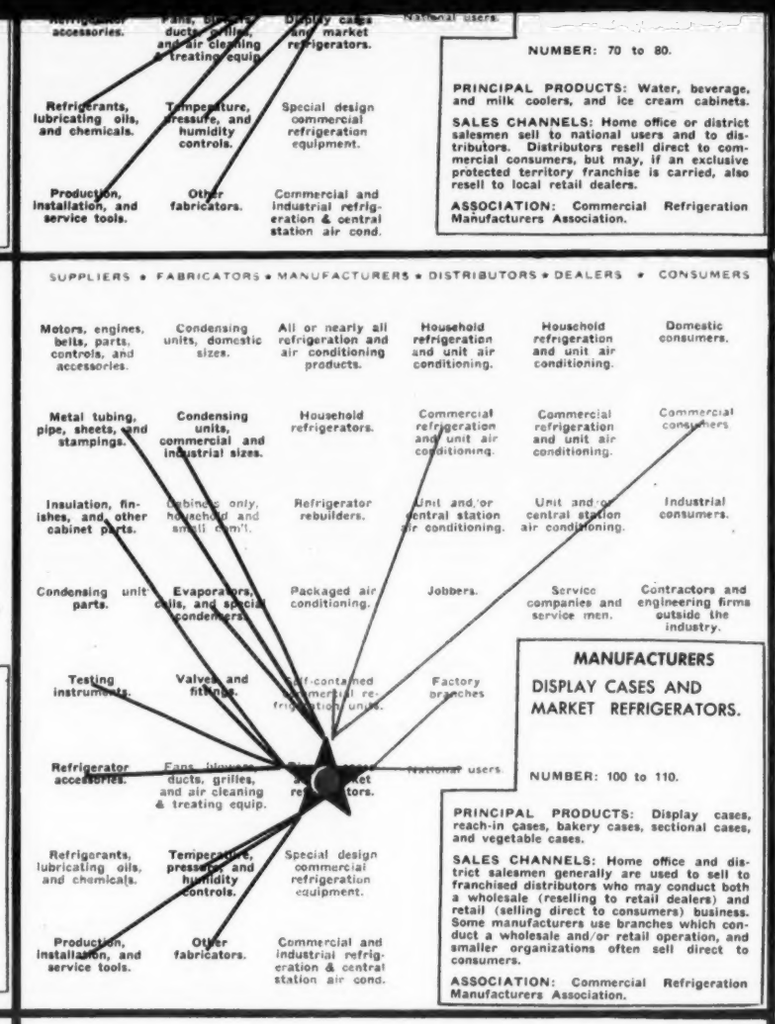
Temperature, pressure, and humidity controls.
Special design commercial refrigeration equipment.
Production, installation, and service tools.
Other fabricators.
Commercial and industrial refrigeration & central station air cond.
FABRICATORS
FANS, BLOWERS, DUCTS, GRILLES, AND AIR CLEANING AND TREATING EQUIPMENT.
NUMBER: 110 to 120.
SALES CHANNELS: Company salesmen, agents, and branch offices sell to manufacturers for original equipment use, to distributors of air conditioning for field assembled jobs, and to jobbers who resell to small trade operators for installation and replacement use.


SUPPLIERS ★ FABRICATORS ★ MANUFACTURERS ★ DISTRIBUTORS ★ DEALERS ★ CONSUMERS
Motors, engines, belts, parts, controls, and accessories.
Condensing units, domestic sizes.
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National users.
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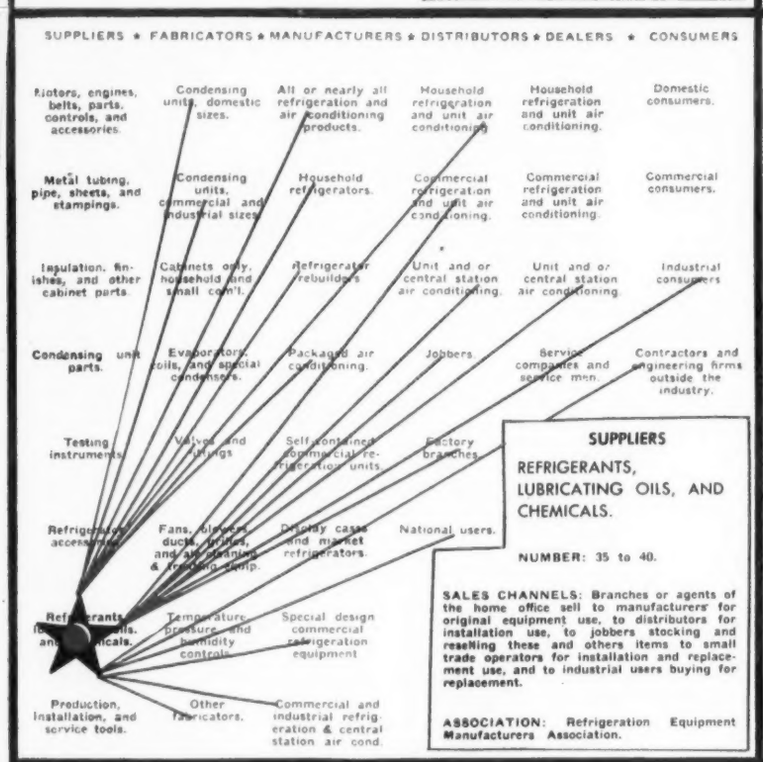
Temperature, pressure, and humidity controls.
Special design commercial refrigeration equipment.
Production, installation, and service tools.
Other fabricators.
Commercial and industrial refrigeration & central station air cond.
MANUFACTURERS
DISPLAY CASES AND MARKET REFRIGERATORS.
NUMBER: 100 to 110.
PRINCIPAL PRODUCTS: Display cases, reach-in cases, bakery cases, sectional cases, and vegetable cases.
SALES CHANNELS: Home office and district salesmen generally are used to sell to franchised distributors who may conduct both a wholesale (reselling to retail dealers) and retail (selling direct to consumers) business. Some manufacturers use branches which conduct a wholesale and/or retail operation, and smaller organizations often sell direct to consumers.
ASSOCIATION: Commercial Refrigeration Manufacturers Association.


SUPPLIERS ★ FABRICATORS ★ MANUFACTURERS ★ DISTRIBUTORS ★ DEALERS ★ CONSUMERS
Motors, engines, belts, parts, controls, and accessories.
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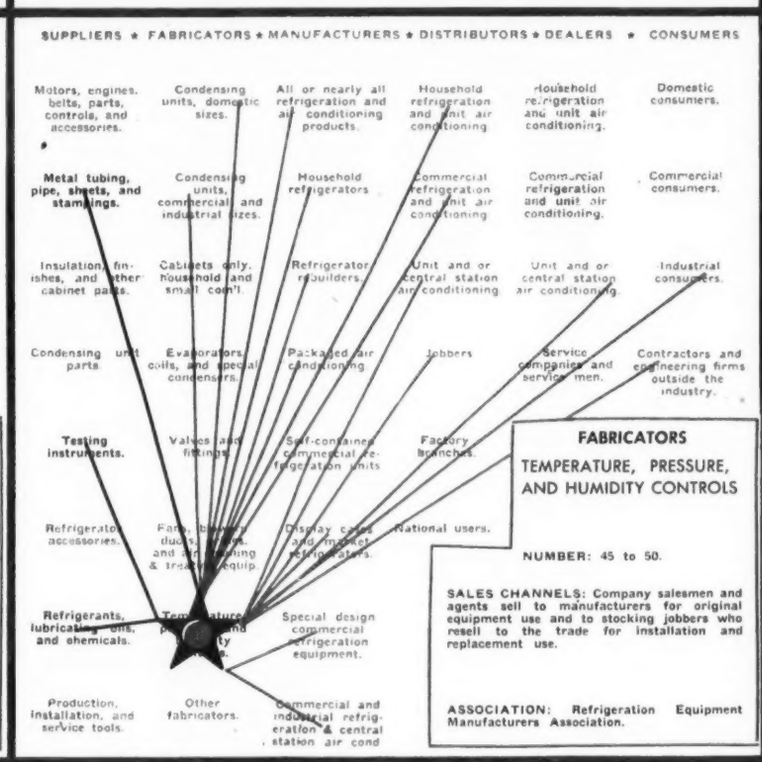
National users.
Refrigerants, lubricating oils, and chemicals.
Temperature, pressure, and humidity controls.
Special design commercial refrigeration equipment.
Production, installation, and service tools.
Other fabricators.
Commercial and industrial refrigeration & central station air cond.
SUPPLIERS
REFRIGERANTS, LUBRICATING OILS, AND CHEMICALS.
NUMBER: 35 to 40.
SALES CHANNELS: Branches or agents of the home office sell to manufacturers for original equipment use, to distributors for installation use, to jobbers stocking and reselling these and others items to small trade operators for installation and replacement use, and to industrial users buying for replacement.
ASSOCIATION: Refrigeration Equipment Manufacturers Association.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Temperature, pressure, and humidity controls.
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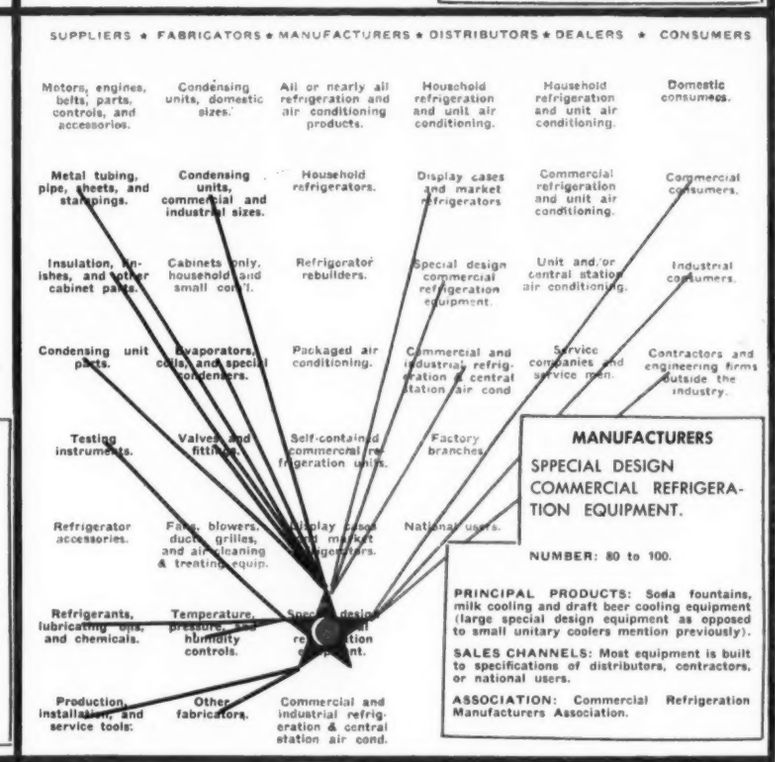
Production, installation, and service tools.
Other fabricators.
Commercial and industrial refrigeration & central station air cond.
FABRICATORS
TEMPERATURE, PRESSURE, AND HUMIDITY CONTROLS
NUMBER: 45 to 50.
SALES CHANNELS: Company salesmen and agents sell to manufacturers for original equipment use and to stocking jobbers who resell to the trade for installation and replacement use.
ASSOCIATION: Refrigeration Equipment Manufacturers Association.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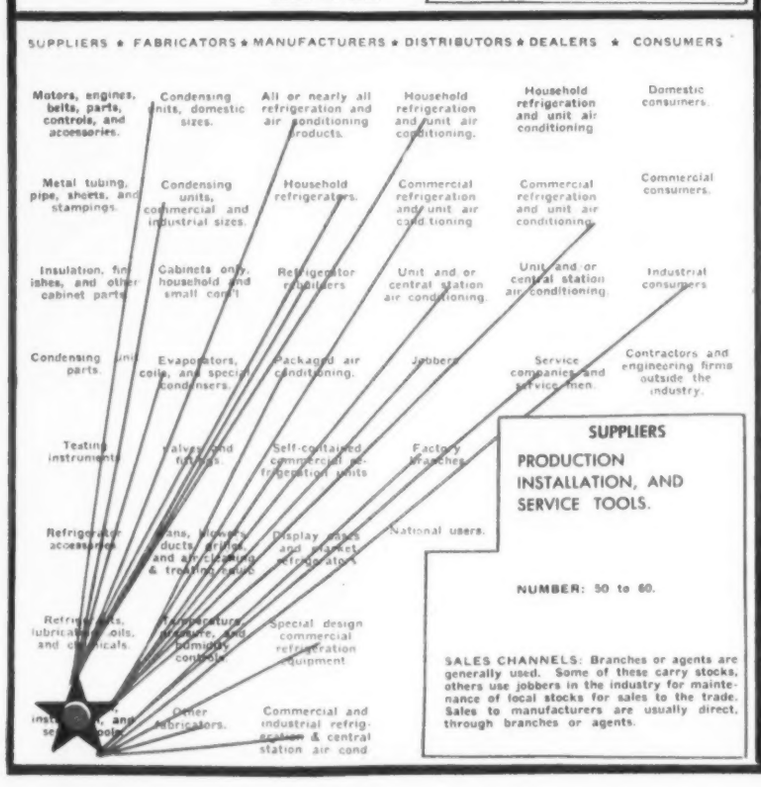
Other fabricators.
Commercial and industrial refrigeration & central station air cond.
MANUFACTURERS
SPPECIAL DESIGN COMMERCIAL REFRIGERATION EQUIPMENT.
NUMBER: 80 to 100.
PRINCIPAL PRODUCTS: Soda fountains, milk cooling and draft beer cooling equipment (large special design equipment as opposed to small unitary coolers mention previously).
SALES CHANNELS: Most equipment is built to specifications of distributors, contractors, or national users.
ASSOCIATION: Commercial Refrigeration Manufacturers Association.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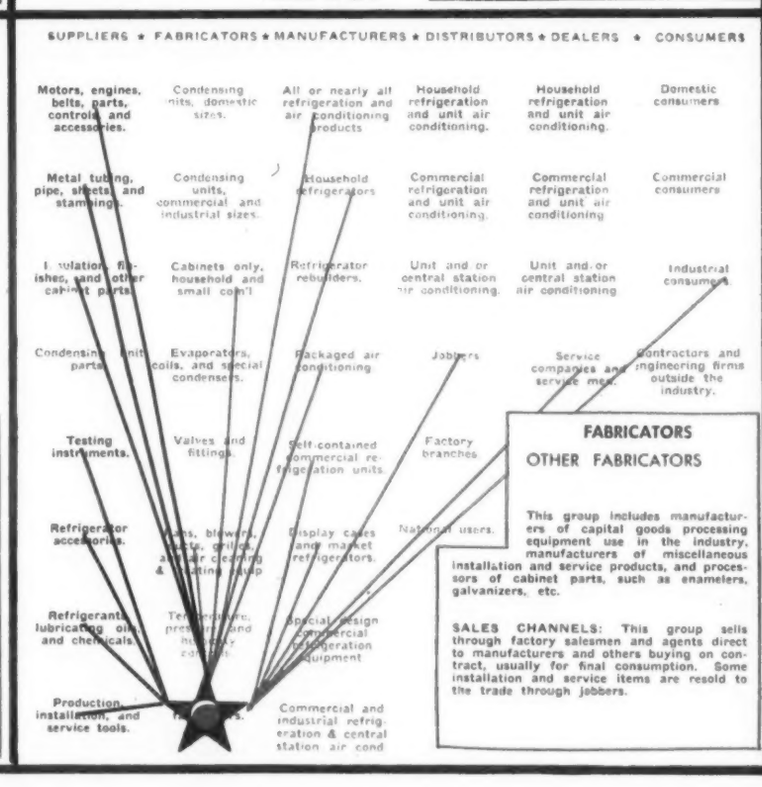
Other fabricators.
Commercial and industrial refrigeration & central station air cond.
SUPPLIERS
PRODUCTION INSTALLATION, AND SERVICE TOOLS.
NUMBER: 50 to 60.
SALES CHANNELS: Branches or agents are generally used. Some of these carry stocks, others use jobbers in the industry for maintenance of local stocks for sales to the trade. Sales to manufacturers are usually direct, through branches or agents.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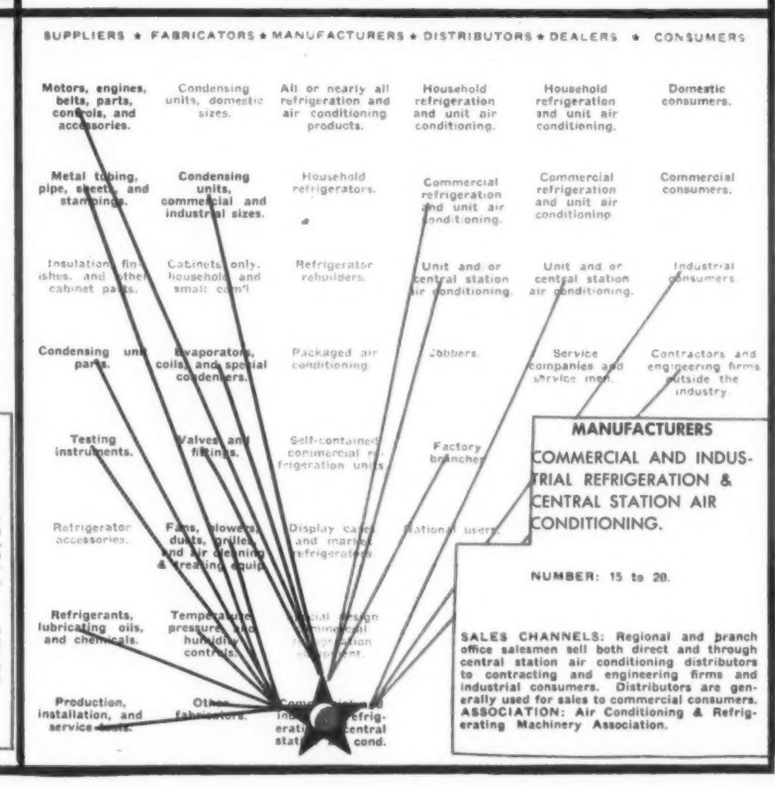
FABRICATORS
OTHER FABRICATORS
This group includes manufacturers of capital goods processing equipment use in the industry, manufacturers of miscellaneous installation and service products, and processors of cabinet parts, such as enamelers, galvanizers, etc.
SALES CHANNELS: This group sells through factory salesmen and agents direct to manufacturers and others buying on contract, usually for final consumption. Some installation and service items are resold to the trade through jobbers.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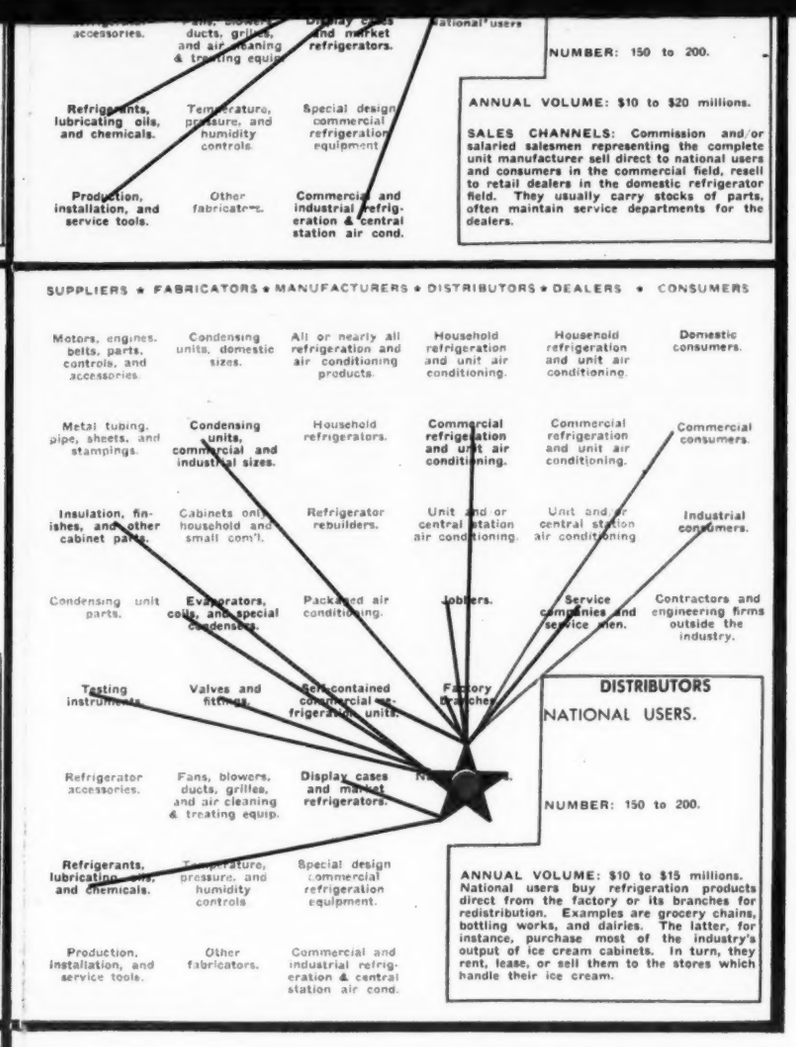
Special design commercial refrigeration equipment.
Production, installation, and service tools.
Other fabricators.
Commercial and industrial refrigeration & central station air cond.
MANUFACTURERS
COMMERCIAL AND INDUSTRIAL REFRIGERATION & CENTRAL STATION AIR CONDITIONING.
NUMBER: 15 to 20.
SALES CHANNELS: Regional and branch office salesmen sell both direct and through central station air conditioning distributors to contracting and engineering firms and industrial consumers. Distributors are generally used for sales to commercial consumers.
ASSOCIATION: Air Conditioning & Refrigerating Machinery Association.


accessories.
ducts, grilles, and air cleaning & treating equip.
and market refrigerators.
NUMBER: 150 to 200.
Refrigerants, lubricating oils, and chemicals.
Temperature, pressure, and humidity controls.
Special design commercial refrigeration equipment.
ANNUAL VOLUME: $10 to $20 millions.
SALES CHANNELS: Commission and/or salaried salesmen representing the complete unit manufacturer sell direct to national users and consumers in the commercial field, resell to retail dealers in the domestic refrigerator field. They usually carry stocks of parts, often maintain service departments for the dealers.
Production, installation, and service tools.
Other fabricators.
Commercial and industrial refrigeration & central station air cond.
SUPPLIERS ★ FABRICATORS ★ MANUFACTURERS ★ DISTRIBUTORS ★ DEALERS ★ CONSUMERS
Motors, engines, belts, parts, controls, and accessories.
Condensing units, domestic sizes.
All or nearly all refrigeration and air conditioning products.
Household refrigeration and unit air conditioning.
Household refrigeration and unit air conditioning.
Domestic consumers.
Metal tubing, pipe, sheets, and stampings.
Condensing units, commercial and industrial sizes.
Household refrigerators.
Commercial refrigeration and unit air conditioning.
Commercial refrigeration and unit air conditioning.
Commercial consumers.
Insulation, finishes, and other cabinet parts.
Cabinets only, household and small com'l.
Refrigerator rebuilders.
Unit and/or central station air conditioning.
Unit and/or central station air conditioning
Industrial consumers.
Condensing unit parts.
Evaporators, coils, and special condensers.
Packaged air conditioning.
Jobbers.
Service companies and service men.
Contractors and engineering firms outside the industry.
Testing instruments.
Valves and fittings.
Self-contained commercial refrigeration units.
Factory branches.
DISTRIBUTORS
NATIONAL USERS.
Refrigerator accessories.
Fans, blowers, ducts, grilles, and air cleaning & treating equip.
Display cases and market refrigerators.
NUMBER: 150 to 200.
Refrigerants, lubricating oils, and chemicals.
Temperature, pressure, and humidity controls
Special design commercial refrigeration equipment.
ANNUAL VOLUME: $10 to $15 millions. National users buy refrigeration products direct from the factory or its branches for redistribution. Examples are grocery chains, bottling works, and dairies. The latter, for instance, purchase most of the industry's output of ice cream cabinets. In turn, they rent, lease, or sell them to the stores which handle their ice cream.
Production, installation, and service tools.
Other fabricators.
Commercial and industrial refrigeration & central station air cond.

materials producers to ultimate consumers.

The chart is divided into 38 squares, each representing one of the 38 different general *types* of suppliers, fabricators, unit manufacturers, distributors, dealers, and consumers serving or served by the industry.

Each of these squares is a reproduction, in miniature, of the entire chart. The star within each square represents the relative position of the square to the entire chart, and the relative position of the type of company or individual covered by the star to the distribution plan of the entire industry. Arrangement of squares within each vertical column is based on convenience and does not necessarily indicate relative importance of the various types of organizations with the columns.

Brown lines radiating from the star indicate the main sources from which such a company usually buys. Green lines indicate the different shown by a green line in the square at the top of the "Suppliers" Column. This purchase is also represented by a brown line in the square devoted to the domestic condensing unit fabricator at the top of the "Fabricators" Column, and his sale of the completed unit to the manufacturer of household refrigerators is indicated by a green line in the same square.

The purchase of this condensing unit by the manufacturer of household refrigerators is shown by a brown line in the second square from the top of the "Manufacturers" Column. His sale of the complete refrigerator to a distributor of household refrigerators is shown by a green line in the same square.

Similarly, the distributor's purchase of this unit, its resale to the dealer, the dealer's purchase of it and its resale to the consumer, and the domestic consumer's purchase are shown by brown and green lines in squares at the top of the "Distributors," "Dealers," and "Consumers" Columns.

Table of The Industry's Sales in 1940

Domestic Refrigeration—*A $418,880,000 market*

WORLD SALES	EXPORTS	U. S. SALES	RETIREMENTS	TOTAL IN USE JAN. 1, 1941	WIRED HOMES
2,720,000	150,000	2,570,000	280,000	15,855,000	25,536,627

PER CENT SATURATION	AVERAGE SIZE	AVERAGE VALUE	TOTAL RETAIL VALUE
63.5	6.5 CU. FT.	$154	$418,880,000

Commercial Refrigeration—*A $219,282,000 market*

COMMERCIAL CONDENSING UNITS	UNITS SOLD
1. LESS THAN 1-3 HP.	79,000
2. 1-3 HP.	69,000
3. 1-2 HP.	40,000
4. 3-4 HP.	23,000
5. 1 HP.	14,000

SELF-CONTAINED UNITS	
6. WATER COOLERS	31,000
7. ICE CREAM CABINETS	42,000
8. BEVERAGE COOLERS	61,000
9. MILK COOLERS	2,000

CABINETS AND CASES	
10. WATER COOLERS	12,000
11. ICE CREAM CABINETS	22,000
12. BEVERAGE COOLERS	24,000
13. MILK COOLERS	8,000
14. DISPLAY CASES AND MARKET REFRIG.	42,540

COMMERCIAL & INDUSTRIAL CONDENSING UNITS	
15. UNITS FROM 1 1-2 to 10 HP.	27,367
16. UNITS FROM 11 HP. UP	5,682
17. OTHER EQUIPMENT	

Air Conditioning—*A $75,000,000 market*

	NUMBER	VALUE
PACKAGED WINDOW COOLERS	23,000	$ 3,500,000
PORTABLE ROOM COOLERS	2,500	875,000
PORTABLE STORE COOLERS	5,000	7,000,000
UNITARY CENTRAL SYSTEMS	1,500	5,000,000
ASSEMBLED CENTRAL SYSTEMS	8,000	59,000,000
TOTAL INSTALLATIONS	**40,000**	**$75,375,000**

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